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Buxton Hall, Williamstown, Mass.—Country House of Alvah K. Lowrie

JAMES PURDON, *Architect*

THANKS to the insistence on the part of architects in this country, we may not be held up in ridicule to all the world for the bad taste of our domestic architecture. With each succeeding year there reach completeness examples of the very best expression of the pretentious country house. No longer does blatancy rule nor assertiveness coupled with poor design offend the artistically trained eye. There is a well sustained harmony, indoors and out. Probably we may never again follow the custom so common during the time of the Georges in England when the architect was summoned to a conference with my Lord and his Lady to suggest and supervise every detail of a stately occasion. Then the architect suggested or designed the decorations, the placing of each set piece, and, odd as it may seem to-day, went into a very serious conference with the ladies of the family as to the cut and color of their gowns, and the "patches" they should wear. Certainly if such a custom were revived to-day, architects would need to become more versatile than now, and probably there is no profession to-day that demands more varied accomplishments than the successful practice of architecture. But excepting those features of fashion and social form it is very plain to be seen that clients who are spending large sums of money on palatial country houses are more and more lending a listening ear to the counsel of their architects. The result is shown in our country houses and Buxton Hall at Williamstown, Mass., the country home of Alvah K. Lowrie, is a very fine example.

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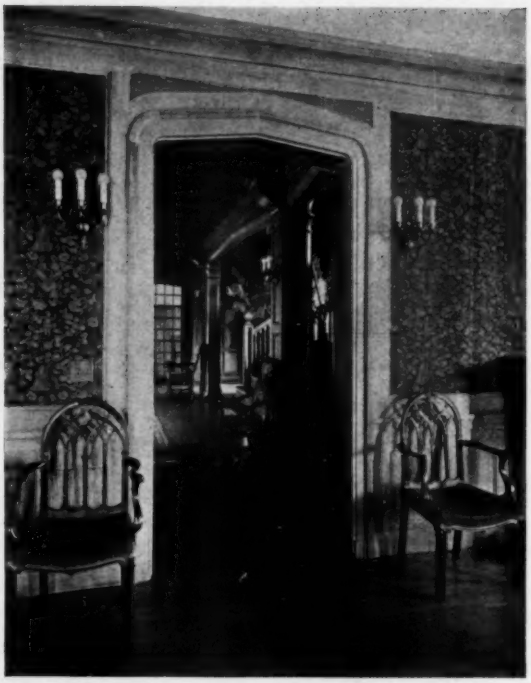
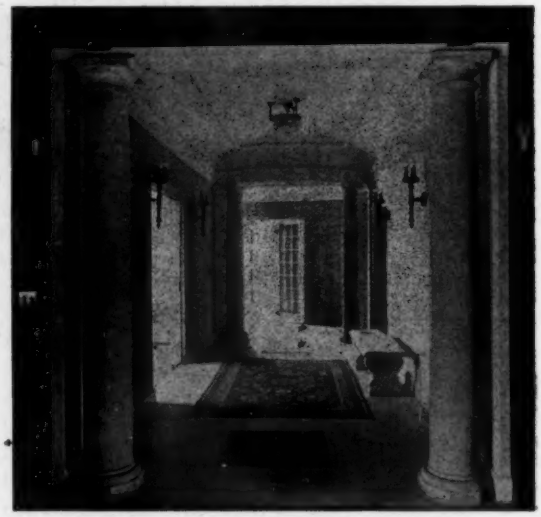
NEW ENGLAND is perhaps more intimately associated with English tradition than any other of our colonial states, not even excepting Virginia. Architects throughout the New England states have by the adaptation of the very best English architectural types, modified to suit our own conditions, kept this local type always in evidence. It was natural, therefore, that Mr. Purdon should have designed along the best features of the stately English manor house. In fact, no other type could so fittingly be set down among such surroundings that in a large measure suggest the English country landscape. The general view of this house, taken looking across the greensward far away to the mist-enveloped, low lying hills will suggest just such a type of house as here so fittingly supplements its surroundings. All the viewpoints from which photographs of the exterior have been made are interesting; all will repay careful study and analysis of their dominating features. Supplementing the work of the architect there has become a very intimate co-operation with the landscape architect, a profession that is steadily assuming a very great and desirable importance. When the landscape is treated with the reverence it should receive, when the hand of man has been so cleverly concealed as only to suggest the work of nature, there is the best expression of landscape architecture. It largely helps to create that true feeling of domesticity, of a well conducted home life that it is necessary to maintain among such restful surroundings lest all be lost in a general feeling of inconsistency and an aspect of incongruity.

VESTIBULE

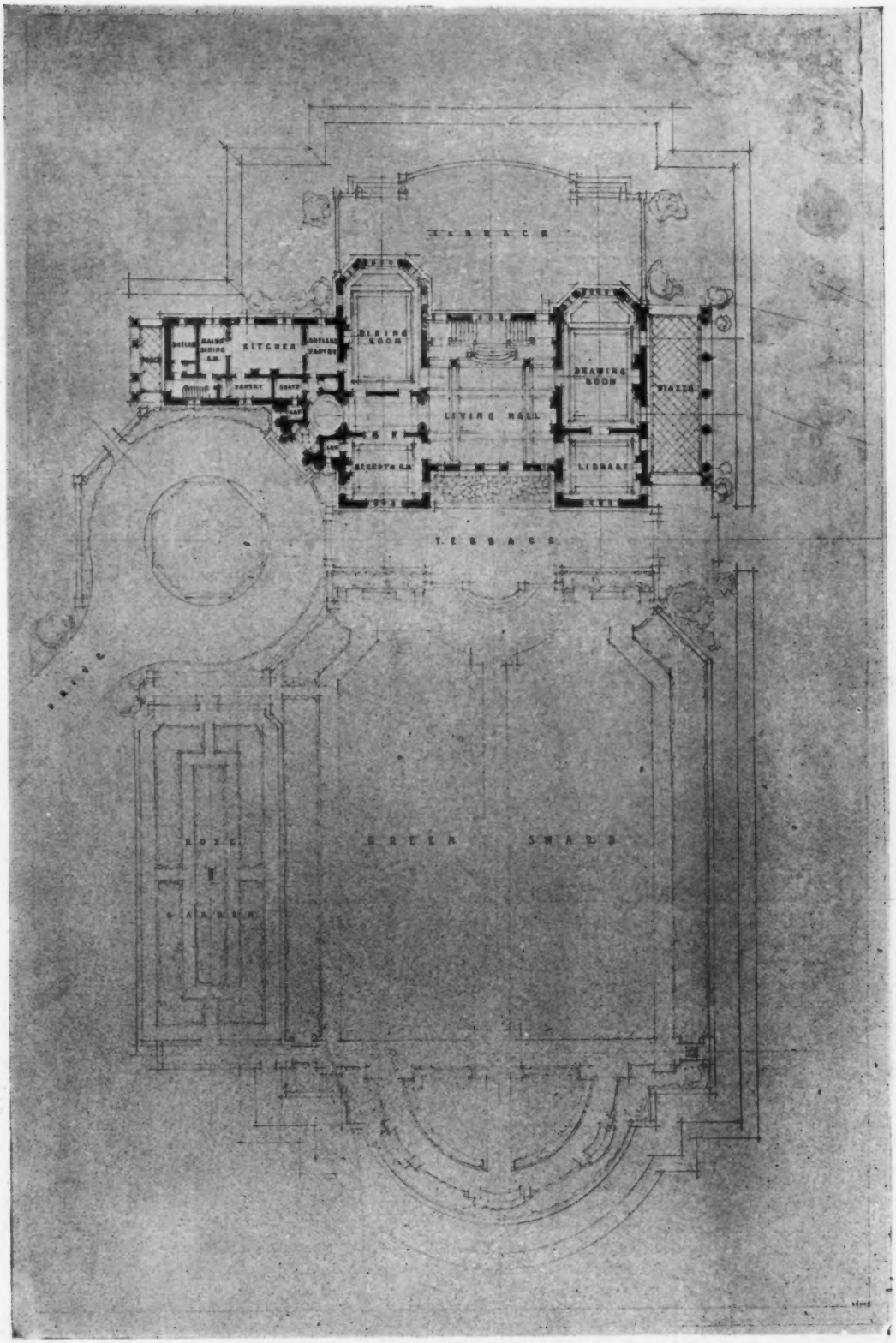
French caenstone, limestone columns and Tennessee marble floor



HALL, FROM LIVING ROOM



ENTRANCE HALL



PLOT PLAN

BUXTON HALL, WILLIAMSTOWN, MASS., COUNTRY HOUSE OF ALVAH K. LOWRIE

JAMES PURDON, *ARCHITECT*

The plan of Buxton Hall is about as simple as could be devised to serve the needs of so large a house. Like its prototypes abroad, the main element is the large living hall, to-day, as in baronial times, the central point of the domestic life of the household as it is also the chamber wherein are held the more stately social functions.

The disposition and placement of the remaining rooms on the ground floor follow the best expression of our methods of country life. Convenience of circulation, the grouping of rooms of ceremony together and the accessibility of rooms of daily use and those that serve them. Planning in this country has become a very fine thing.

RECEPTION ROOM

HARRIAN TYPE BARRACK WITH AN UNEXPECTED VISITOR

Reconstruction of Northern France

The First Building Problem in the Devastated Regions

By RALPH FANNING

THE word "Reconstruction" has, for the architect, as for all the world, a pleasant sound. It suggests the righting of wrongs, the re-establishing of old order out of chaos and the making of shattered buildings into their former unity and beauty. The architect is apt to associate with the word that of "restoration" with all the interest and studious research that such a word has usually implied. The first tasks that awaited the reconstructional builder in Northern France were more prosaic. To the first builders in the devastated areas, reconstruction came more often to mean dead horses and putrid debris, broken stones and crumbling mortar, scrap iron and unexploded shells rather than architectural studies or garden cities. Problems of sanitation, of social adjustment or even of bare existence for the workers and returning people had to be faced before very much could be attempted in the matter of rebuilding. However, no one factor seemed to play a greater part in the big problem of the renewal of any satisfactory life in a stricken village than the establishment of new homes, be they only one roomed abodes, one of which a long suffering family could claim as its own. With his own roof-tree once more, the French peasant could face the tasks of the new regime with some confidence and courage.

The immediate building work of the "region liberee" was largely relief work and as such could usually be divided into two parts for the work of rehabilitation in any village, briefly that of repair work and of barrack erection. As in nearly every village to which the inhabitants were able to return, houses could be found in many stages of decay or destruction, from that of being merely dust filled to being themselves mere heaps of dust, repair work could take numerous forms according to the amount of labor and materials available. Barrack building, that is the erection of portable, wooden sectional houses, was resorted to where the houses were beyond repair or where a cleared site was selected for the new home groups.

A first difficulty in repair work was offered by a dearth of building materials which are still scarce and proportionately expensive in most parts of Europe. The emergencies of war used up most of the available lumber supply of France, although the forest protection laws did not sanction the wholesale slaughter of growing timber as has so frequently

A STREET CORNER IN THE NEW PART OF SERMAIZE-MARNE

been the case in this country. Many saw-mills in the North were demolished and robbed of their machinery, while many in the other parts of the country were not able to furnish near their regular output, due to lack of man power and raw materials. What was true of building lumber was true of many other materials, especially cement, plaster, glass, nails and all metal work. The American Red Cross brought in generous supplies for the rehousing work, and after the armistice, the engineering divisions of the armies were able to liquidate for reconstruction purposes large supplies of tools and materials that had been collected near the front for future drives. Where these materials were thus available, there was that ever difficult problem of getting the supply to the demand, of overcoming transport difficulties and of guarding against local and individual profiteering.

The debris and fallen plaster removed, safety from dangerous walls and unexploded shells assured and the general conditions made somewhat sanitary, the problem of repairs needed to be quickly tackled. A solid roof to protect against the plentiful rainfall was a first consideration. Minor holes and leaks could be temporarily patched with tar paper. More satisfactory roof repairs could usually be attempted by replacing or reinforcing any damaged girders or rafters and, from the removed tile, selecting the unbroken ones that would cover well one necessarily small slope or section to insure at least one room fit for dry habitation. Most houses of Northern France were covered with century old, half cylindrical interlocking tiles which, covered with moss and assuming gently sloping lines with the years, gave the roof a texture and color that must have charmed many an artist eye. The French tuilleries have not been manufacturing this shaped tile for a considerable number of years past, due to their far greater consumption of material than the less picturesque, though more efficient, modern interlocking shingle tile. This alone made the restoration of many of the delightful old, but partially porous, roofs impossible, although attempts were made to collect the ancient tile from some abandoned roof for patchwork upon others specially worthy of preservation.

WINDOW glass was an almost universally minus quantity nor could much be safely installed during the summer following the cessation of hostilities without a risk of its being shattered by explosions of waste ammunition which was being destroyed in great heaps at numerous places. Oiled paper and prepared cloth of various kinds were used to keep out wind and rain and afford some light, but the advent of new glass was a great factor in bringing sunlight and cheer and sanitation into the gloomy homes. French windows were usually designed to hold comparatively large panes of glass of little uniformity of size or shape, which added another difficulty to that of a broken, warped and worm-eaten sash requiring kilos of putty and brads for the proper installation of new glass. At a so-listed "undestroyed" hospital at Clermont en Argonne, the reglazing alone cost the hard and continuous labor of three men nine weeks time and the material expenditure of several thousand francs.

"THE TOWN PUMP" CITÉ AT SERMAIZE LES BAINS, ERECTED BY THE ENGLISH FRIENDS

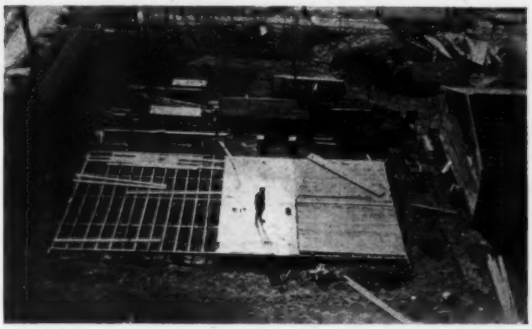
With plaster and cement much repair work could

be done with the crushed and broken stones always at hand. This, however, required skilled labor for efficient work and native masons were hard to find during or after the war. A liberal distribution of whitewash, with glue and brushes for the same, was

A RECONSTRUCTED CITÉ IN THE MARNE, BUILT BEFORE THE ARMISTICE BY THE SOCIETÉ DES AMIS. BRICKS WERE AVAILABLE FOR THIS SCHEME

a great asset toward the health and cheerfulness of the homes, while in some cases great pleasure and renewed hope could be furnished by bright wall paper, so great is the physiological effect of environment upon the French or any other family. Broken door hinges, shutters and locks were the minor details that the problem of rehabilitation had to offer, but which were often as distressing to a wearied Madame as trembling walls and tottering chimneys, once the filth and debris had been removed from within her walls.

In spite of this enumeration of difficulties, there was, to the architect or reconstructional builder, a fascination about even the most prosaic of repair work besides the inspiration that came from rendering aid and encouragement to a tired and disheartened people. The devastation revealed many interesting bits of ancient construction; the technique of massive masonry; giant post and lintels that, embedded in the masonry, might have been the forerunner of our modern steel skeleton work; great wooden trusses of curious triangulation, probably untried by any student of graphics, but built according to traditional rule of thumb; odd mixtures of mud and timbers; coverings of slate or metal over forms unique and surprising. In some cases explosions would remove the sides of houses so as to reveal the vaults, floor and roof construction as plainly as a draftsman's section. The backing or bind of some unusual arch, the course of some curious chimney, the



THE BEGINNING OF A BARRACK, CHALONS

core of some puzzling wall could be studied at first hand dissection. With all the pitifulness of shattered houses, there was this fascination for an architect learning as it were the anatomy of the structure as he strove to render first aid in binding up and dressing its wounds.

The erection of a barrack was a simple matter provided the site could be determined and, what

ELEPHANT IRON STORAGE HUTS

A COMPLETED BARRACK, HOME CITÉ DE LA SOCIETÉ DES AMIS, MEUSE

was a more serious problem, the sections for it deposited near the desired place. Demountable or sectional wooden houses were manufactured after various types and patterns by interned French soldiers and refugees in Switzerland and other places where lumber could be obtained during the war. With a supply of these ready on hand, the minute hostilities

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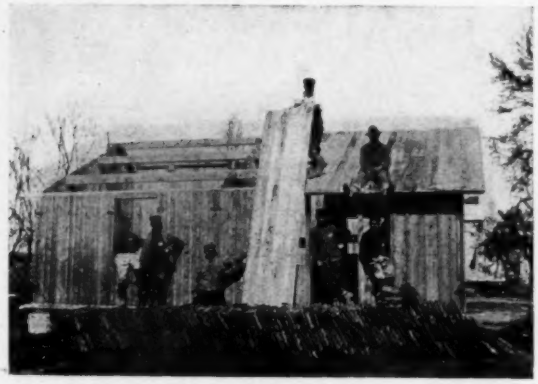
A SWISS CUT TIMBER 5-ROOM HOUSE

or military orders would permit, the barracks might be rushed to the needy district and the returning populace quickly and comfortably housed, thus lessening the period of direst suffering for a totally destroyed village.

EVERY refugee family returning to the villages of the Meuse sector west of Verdun were enabled to obtain a needed home barrack from the Societe des Amis, an Anglo-American organization for the relief of war victims, that had worked in France during the Franco-Prussian war of 1870, and with the outbreak of the European war in 1915 were early on the field to help the suffering civilian population. This organization had established sawmills and section and window factories at Dole and Ornans in the Jura. By a special government grant, lumber was obtained from Switzerland, from which a specially durable, yet easily mounted, type of barrack was made. From the required number of typical sections, three sizes of houses could be erected, two, three or four roomed with or without "hangars" or sheds. With floor joists and roof girders cut to proper length and the floors and ceilings as well as supporting walls in madeup sections, the houses could be rapidly erected even by unskilled labor, two men being able to handle any section. The section walls which supported the roof timbers were of double thickness, with dead air space between, the interior boarding being smooth, ready for whitewashing or papering, as the occupant desired, while the outer boards were connected by cover strips and usually creosoted a rich brown.

READY FOR THE ROOF—SECTION BARRACKS FOR REHOUSING IN THE "REGION LIBEREE"



ROOF SECTIONS, NEARLY READY TO THROW UP THE TILE

Other types of barracks were used by other emergency builders, some for more temporary housing, as the Blockus type, others like the Hadrian type used for the foyer des soldats, capable of being extended to any desired length by continuing the sections. A patent sectional barrack of concrete was advocated in some regions, but offered difficulties of transport and manufacture in regions where suitable sand for concrete could not be found. Small houses of brick were built with success in the Marne districts, where the foundries were able to continue their output of clay products. Among the types of ready made houses were several different patterns, differing chiefly in their ease, and thus efficiency, of erection. From one part of the Vaud canton of Switzerland was produced timbers cut to sizes ready to be made into very substantial frame dwellings, something on the order of the ready made houses put out in America by several well-known companies. These required more skill and time for erection as well as costly nails, and so were not as popular for the preliminary housing as the simpler sectional baraquements. For storage and form buildings the military semi-cylindrical "elephant huts," iron sections forming a twenty foot tunnel, were used after the armies had discarded them, while excellent concrete balloon-anchors and artillery bases made solid foundation material. In spite of the compactness of the pre-war French village and the congested conditions of refugee life, the idea of several families oc-

cupying one large barrack never seemed to work out successfully. In fact, it has lead to rather wretched social conditions wherever it has been tried, for mankind at large seems to be too far from the savage or perhaps not yet highly enough developed to make communal life at such close quarters a success.

WHERE only parts of a village has been destroyed, it was usually beyond the question of emergency housing to do much toward replanning or changing any of the village arrangement, a thing ever difficult to do hastily among the numerous petty property owners. The barrack had usually to be placed where Monsieur or Madame had a cleared space among the ruins for it, in order that some sort of family life might be established as soon as possible. In other instances, especially where the former village would be for the greater part or totally demolished, yet with enough returning citizens to justify it a new site would be chosen for a site on communal property. In some cases, opportunity was given for more model village planning, with some attention to draining, sanitation, convenience and unity in design. Examples of such cites may be seen at Sermaizes les Bains and Paragny in the Marne, fully established by the English Friends two years before the signing of the armistice or at Neuvilly or Aubreville in the Meuse. Opportunities for studied planning were rare in the first emergency relief work, but occasional improvement could be made in location and sanitary arrangement. Farmsteads were re-established on the separate farms rather than huddled together in congested centers, now that the fires had swept away village traditions. The first thing was to give shelter to the returners and make for them as comfortable and encouraging a substitute for home as was possible in a short time, so that the long suffering people could pick up the broken threads of the torn fabric of their existence. With the fabric intact, even in small or sadly stained pieces, some design and embellishment may be considered for the future.

To Reset Plymouth Rock

PLANS for resetting Plymouth Rock and for improving the waterfront at Plymouth have been approved by the Federal Pilgrim Tercentenary Commission, which voted to released $300,000, the Federal Government appropriation for the work proposed.

Under the plan Plymouth Rock will be set again in the water and will be covered by a canopy of stone to be erected by the Society of Colonial Dames. Improvements of the shore are being delayed by excessive demands by owners of property involved, according to the report of the local committee.

The Federal commission decided to withhold the $100,000 appropriated for Provincetown until it presented a definite plan.

At the meeting Congressman Joseph Walsh showed proofs of the Pilgrim Tercentenary stamps to be issued by the Post Office Department. They will be of one, two and five cent denominations.

The 1-cent stamp will be green, with a picture of the Mayflower in the centre. On one side will be the hawthorne, the May flower of England, and the other the arbutus, the May flower of New England. At the top will be the words "Pilgrim Tercentenary."

The 2-cent stamp will be similar in general design, with a picture of the landing of the Pilgrims, and will be red.

The 5-cent stamp will have as its centrepiece the Signing of the Compact and will be blue.

The celebration is to begin on Dec. 21 of this year with formal exercises at Plymouth, and it is planned to have the day observed nationally as Forefathers' Day. The principal celebration, however, will come next Summer.

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Building Prospects

A Well Considered Editorial Review of the Building Situation in the Middle West

THE only change since our last issue in the building situation, states the September issue of the *Bulletin of the Illinois Society of Architects,* is the further postponment of many large projects, a continued increase in the cost of practically all materials entering into any structure and a further advance in bankers commission charges for building loans.

Many owners who have had complete plans and specifications for important work prepared are ready to proceed notwithstanding the present high building costs if they could secure any assistance from the banking interests in financing; but with U. S. bonds selling in the open market at prices netting the investor over 6 per cent., with foreign government bonds selling at prices netting better than 8 per cent., with securities of firstclass industries realizing from 9 per cent. to 12 per cent., there is practically no money available for building operations.

Perhaps one way to temporarily stimulate the construction of buildings of all classes would be to amend the present Income Tax law and exempt from taxation for a period of say five years all moneys invested in new buildings. This exemption, if granted, would make first mortgage securities more attractive to investors and would undoubtedly result in large sums being immediately placed at the disposal of builders.

It is a peculiar circumstance that, notwithstanding the great falling off in the amount of work contracted for in Chicago and vicinity that the cost of almost all building materials are continually advancing.

The editor recently addressed a letter to a representative contractor in each of the various building trades doing work in Chicago, this letter being as follows:

"The writer, as editor of the Bulletin, is collecting data as a basis for a short article on 'building costs.'

"Will you do me the courtesy of replying at once and advising me of the percentage or amount of increases or decreases that have occurred since August 1 in the cost of building materials used by you, and oblige."

A tabulation of the replies received follows:

Material.	Increase per cent.	Decraese, per cent.
Cement	16¾	....
Torpedo Sand	6¼	....
Bank Sand	6¼	....
Stone or Gravel	6¼	....
Lime	8	....
Carney's Cement	15	....
Flue lining	30	....
Tile Coping	30	....
Plaster Board	14	....
Fire Brick	25	....
Hydrated Lime	5	....
Pyrobar	8	....
Waterproofing Cement	20	....
Partition Tile	2½	....
Reinforcing Steel	12	....
Structural Timber	....	10
Form Lumber	5½	....
Structural Steel & Iron	3	....
Cut Stone	17½c per. cu. ft.	....
Plastering Materials	10	....
Ornamental Iron	11	....
Boiled Oil	....	20
Turpentine	....	24
Soil Pipe	8	....
Pumps	10	....
Magnesia pipe covering	5	....
Asbestos cement	10	....
Vitri. Asbestos Fibre Blks.	25	....
Cast-iron water pipe	5	....
Cast-iron pipe fittings	8	....
Sewer pipe	10	....
Castings for heating and power boilers	10	....
Plumbing enamel. ware	10	....
Plumbing brass goods	5 to 38½	....
Black and Galvanized Malleable fittings	9 to 52	....
Plumbers' shop tools	5½	....
Assembled plumbing fixtures	16 2-3	....
Cast-iron basins, etc	12	....
Lead pipe per hundred	.55 per lb	....

Where no increases or decreases are noted we are advised that prices quoted today are the same as those of August 1. (In this connection it might be noted that the present selling price of wrought iron pipe is only 6 2/3 per cent. greater than it was three years ago, while the cost of plumbers earthenware has increased over 300 per cent. during the same period of time.)

Owners contemplating building are advised that there are practically no available stocks of most building supplies, and that delays in any building project are bound to occur, due to the impossibility of contractors securing materials as they will be required for any building operation to proceed in an orderly manner.

Owners are further advised that under present circumstances that they are confronted with the certainty of there being further delays in construction, due to the jurisdictional claims of the Chicago union labor trades. As a matter of history, there have been more strikes reported during the past sixty days than ever before in a like period in the history of Chicago. Responsibility for this condition should be placed where it belongs, which is with the Contractors' As-

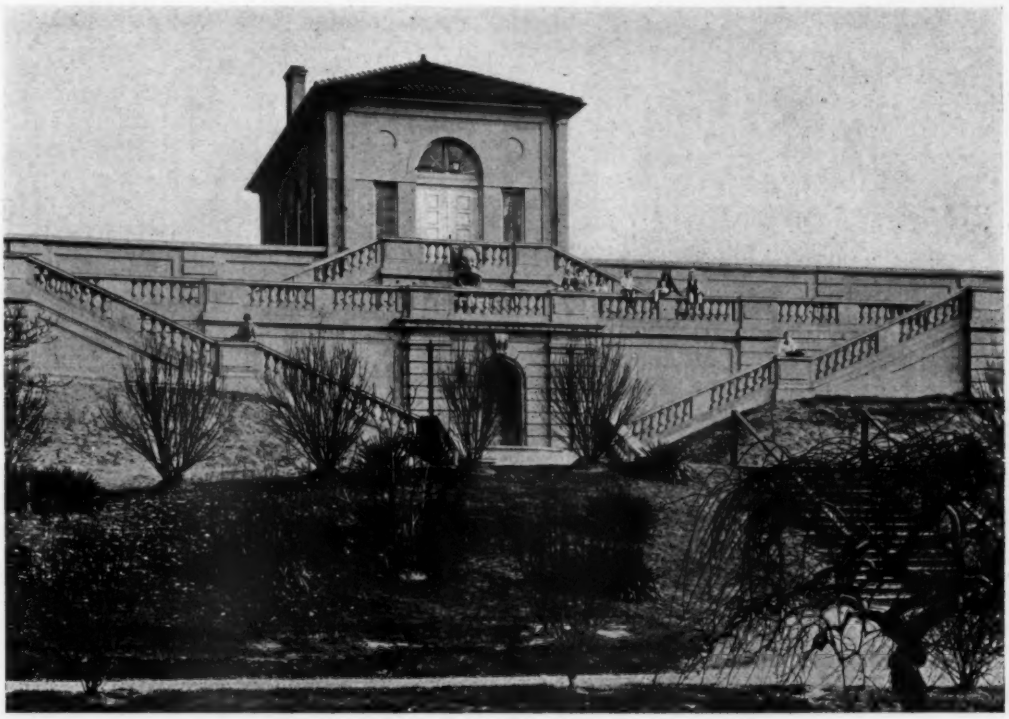
sociations of Chicago. For some reason the carpenters' and masons' associations have refused to affiliate with the Building Construction Employers' Association, and the Building Construction Employers' Association has refused to affiliate with the carpenters and masons. Thus the two big associations are not working together and are apparently unable or unwilling to unite and agree upon a plan of action which could and would control the labor situation in a short time. The situation complained of has been corrected in other cities by the united efforts of all the interests interested in building, and it will never be corrected in Chicago until all employers associations are united under one management, with a strong guiding hand, an autocrat if you will, who must be given the power to act.

At present building operations which sould be consummated in a period of say four month now require eight or ten months to complete, notwithstanding all the efforts are the architect and contractors for the improvement.

Owners contemplating building are advised that it is the editor's opinion that building material costs will continue to be enhanced for many months and that there is no prospect of any immediate lowering of building costs. In fact, building costs will probably increase for at least two years more.

Union labor has agreements which do not expire for many months, so that it is utterly hopeless to expect any reduction in labor costs before this time, and as labor in the ultimate represents by far the largest item in the cost of any building project, building costs cannot and will not be reduced until the wage scales have been revised. Not only the wage scales of the building mechanics, but the wage scales of the laborers and mechanics producing and creating all of the various items of building materials.

This is the condition confronting owners and architects today and there is no use of camouflaging the situation or of kidding our clients or ourselves into believing that building costs are going to be reduced for many months.



ENTRANCE STAIRWAY, COMPTON HILL RESERVOIR, ST. LOUIS, MO.
STUDY & FARRAR, *ARCHITECTS*

XUM

Housing Legislation in the United States

Enabling Acts Passed in Various States, Enabling Functioning in Activities Hitherto Regarded as Private Business

A LETTER has been addressed by Louis L. Suskyn, of the New York Bar, to the daily press, in which enabling acts passed in other States are discussed.

The State of North Dakota, he writes, passed laws which set a new mark in authorizing the State to function in activities that have been considered private business. Under these laws a State commission is authorized to establish a State bank, to loan money on farm land, to build homes and to establish a State warehouse, elevator and flour mill system. The commission is given sweeping powers to manufacture and sell at prices set by it, all kinds of raw and manufactured food products and by-products and to operate markets and agencies anywhere in America or in foreign countries. The commission is empowered to buy all necessary property or seize it by right of eminent domain. The program outlined is to be financed by the State through taxation.

These laws were passed by the Non-Partisan League Legislature of North Dakota. Citizens of that State contended these laws violated the spirit of the Fourteenth Amendment. The United States Supreme Court was called upon to decide the constitutionality of these laws. The court rendered a decision and, in upholding these laws, it distinguished between a tax for private purpose and public purpose. The court reaffirmed former refusals to define the term "due process of law," as contained in the Fourteenth Amendment, and insisted that definitions must be based on each individual case. The North Dakota legislation, said the court, "was adopted under the broad power of the State to enact laws raising by taxation such sums as are deemed necessary to promote purposes essential to the general welfare of the people. With the wisdom of such legislation, and the soundness of the economic policy involved, we are not concerned. Whether it will result in ultimate good or harm it is not within our province to inquire.

In many years and in several instances, continued the court, States and municipalities have in late years seen fit to enter upon projects to promote the public welfare which in the past have been considered entirely within the domain of private enterprise.

The Maine Legislature had given cities and towns the right to establish fuel yards for the purpose of selling wood, coal and fuel at cost to inhabitants. The act defined the term at cost as meaning "without financial profit." The Maine Supreme Court upheld the act and the decision was upheld upon appeal. The ground of said appeal was that the establishment of a fuel yard is not a public purpose and that taxation to maintain one would be taking property without due process of law, which is a violation of the Fourteenth Amendment to the Federal Constitution. It will be noted that the same contention was made by the citizens of North Dakota, who appealed the Non-Partisan League laws to the United States Supreme Court. In upholding the municipal fuel yard laws the United States Supreme Court ruled that there is no difference, of vital magnitude, in a city maintaining a central heating plant that furnished heat through pipes to homes and delivering coal direct to the user's home.

"It seems illogical," said the court, "to hold that a municipality may relieve its citizens from the rigor of cold if it can reach them by pipes or wires placed under or above the highways, but not if it can reach them by teams traveling along the identical highways. It will be something of a task to convince the ordinary intelligent citizen that an act of the Legislature authorizing the former is constitutional, but one authorizing the latter is unconstitutional beyond all rational doubt."

From the above it may be concluded that the New York Legislature in its special session to be held next month may feel itself safe in passing such acts to enable immediate and near-future relief in the housing situation. To allow the use of State funds for building houses for the people will in all likelihood be within the spirit of the Fourteenth Amendment of the Federal Constitution, as decided by the United States Supreme Court.

XUM

The House of a Great Artist

THE late Sir Laurence Alma-Tadema's residence in St. John's Wood—which is now offered for sale—may be said to have been the record of his life, "written in great syllables of color and form," states *The Architects' Journal* of London.

At a cost of over £70,000, he filled the house with tapestries, marbles, metals and precious woods, and just saved the whole from becoming a mere museum by the greatness of his artistic individuality. But of the force of that individuality the individual himself seems to have been least confident, for the initials of his name are burnt in on every tile, woven into every piece of stuff, empanelled on door, floor, and ceiling, as if he had been a little fearful lest it might be overlooked. Never; when one is surrounded, as here, by things he must have worked and waited for, with a place standing vacant for each treasure, which, when secured, was put so confidently in its place, one realizes that the place has become his very self.

Though it is the house of a great artist, there are not many pictures—the panels and the woven tapestries, the fine vistas, the goodly proportions, are themselves the picture.

The great domed studio—over twenty feet high—is said to be the finest in the world. In any case, it is "absolutely unique." The big north-light window gives full upon a Byzantine apse, hung with Tunisian embroideries in rose velvet, and roofed with shining aluminum. The cold light of day is goldened by passing through windows of thin onyx, and gleams softly upon walls panelled in green marble. If one may descend to what would seem the least detail of this temple, the egg-and-tongue moulding worked upon the back of a semi-circular seat in the apse is said to have taken two years to complete.

THE LATE SIR LAURENCE ALMA-TADEMA'S STUDIO

The front door of the house is set in bronze "cast from the door frame of a house in Pompeii," the entrance hall is floored with Persian tiles, and white marble steps lead to an inner hall where over the huge open fireplace are inscribed: "I count myself in nothing else so happy, as a soul remembering my good friends." And the friends he had! The very floor of this inner hall is tiled from a friend's design, the walls are finely decorated by their brushes, and can one ever forget those gatherings where were assembled all the men whose names were first in literature, music, and the arts?

DOORWAY AND BRASS STAIRCASE IN HOUSE OF THE LATE SIR LAURENCE ALMA-TADEMA

The private library and writing-room is built like the Atrium of an old Roman house, with Pompeian

ceilings and walls of alabaster, and from it ascends a staircase leading up to a gallery overlooking the grand studio, impluvium, and palm house.

There is a second studio, used by Lady Alma-Tadema, for she also was an artist, and had her own workshop, and there is even a third studio—in the garden, and only telephonically attached to the house.

"If a man's talk is of oxen, he will dream of oxen," says De Quincey. In Sir Alma-Tadema's best bedroom—white and fine old gold and costly Japanese paper—one will not dream of oxen, however the day has been spent, but will out-dream the opium-eater himself.

It was no ordinary soul who thought out the details of such a home. The very doors are different from other doors, and are constructed so that the two faces are of wood matching the two rooms. Nor did their fitting satisfy this fastidious mind, but they had to be made with a special flange overlapping the jamb, and special hinges fixed accordingly to give the necessary clearance for opening. Is there a golden staircase up to the studio? Then such must be appropriately lighted, and a perfect "harvest moon," a full orb of onyx laden with fire, shines upon it clear by reflected light.

It was hoped by all that this memorial of so great an artist might pass into the keeping of the people, but already one sees poised the auctioneer's hammer, and hears that warning and infinitely disturbing "Going—going—?"

The Freest Country

CHINA, says one enthusiastic traveler, is "the freest country in the world." A writer in the Central China Post admits it, and gives some illustrations that dull somewhat the edge of appreciation.

Liberty of speech and press is so complete, he explains, that it permits blackmail without redress.

The use of public highways is so free and unrestricted that it is not unusual to find a public road dug up and planted in vegetables, or obstructed by a house built on it.

Choice of occupation is so free that anybody who can live by begging is allowed to do so, and beggars take possession of public buildings in bad weather, and camp, unhindered by the authorities, at the door of any merchant who refuses them alms.

There is freedom in sickness. Any citizen is freely permitted to catch any kind of disease, and when a man falls sick of smallpox, typhus or other infectious ailment, his friends and neighbors are at liberty to crowd into the patient's room by day and night, and so, thus helping to spread the infection.

A similar freedom is found even in death. When a man dies who has no near relatives, whoever happens to be burdened with the corpse can put it in a box and deposit, without any formality, by the roadside. It stays there until the box falls to pieces or some Good Samaritan volunteers to bury the body.

Liberty is a glorious thing, but there seems to be such a thing as having too much liberty.

Old Town Hall, Hartford, Conn.

(See reproduction of the original drawing by O. R. Eggers in this issue)

IN 1639, the freemen of Newtown, Conn., now called Hartford, met and adopted the famous Fundamental Order of Connecticut, the first written constitution adopted by a people that ever organized a government. For this reason, historians are wont to declare Hartford "The Birthplace of American Democracy."

The sentiment of independence thus early displayed and which grew to such successful proportions more than a hundred years later, found Hartford ever the center of the political activity that led to the Revolutionary War and the independence of the Colonies.

It is fortunate that the spirit of patriotism should so warmly be espoused by the people of Hartford from so early a period. It is for this reason that we have had preserved to us so many splendid examples of our Colonial building. The old town hall at Hartford was built as a state house in 1796. Its classic lines and correct proportions are the pride of the citizens of Hartford and the delight of those who have been so fortunate as to visit this city.

So carefully have all the various details of this fine old building been preserved, so reverentially have its restorers proceeded with their work, that the building may today be viewed almost exactly as it stood 125 years ago.

Who designed this fine old building we do not know but it is known, for there is much tangible evidence all over New England, that the master builders of our colonial period, founded everything they created on the most classically correct principles of good architecture. The longer they remain as evidences of good, honest and well considered structures, the stronger is their appeal. One is led to wonder why with such excellent examples close at hand there should be erected buildings that suffer so badly by comparison.

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OLD TOWN HALL, HARTFORD, CONN.
THE AMERICAN ARCHITECT Series of Early American Architecture

EDITORIAL

"On With the Dance, Let Joy Be Unconfined"

IN the September issue of the Journal of the A. I. A. under the head of Shadows and Straws, which is the standing title for the editorial utterances of this representative journal, there appears the following:

"Another has written an appreciation of the etchings of Troy Kinney which are published in this issue. I have not yet read what he has to say, but I have no doubt that it will be well said and well worth the saying. Of what I have to say, I have not the same confidence. I think of dancing as the handmaiden of architecture, not because of the direct connection of line and form, which is the essence of design, but because I feel that people who know how to dance beautifully will know how to build likewise. For dancing is the universal sense of rhythm, out of which architecture was born. * * * 'Tis sadly true that the day of Grecian maidens dancing on the flower-strewn banks of rivers has long since passed, yet I have an idea that we are not likely to get much that is real or important in the field of art until the custom is resumed."

Richard III criticized those about him for "capering nimbly in a ladies' chamber to the lascivious pleasing of a lute." Have we not had enough Bunthornes in architecture? Shall we not need, if we are to get anywhere as a profession, emphatically to discourage such a composite figure of the incentives to professional excellence as this whole editorial suggests?

Will the architectural student of the future need to include among the essentials of his daily attendance at college a well polished pair of dancing "pumps"? Or will it become necessary that the reception room of the architect of the future be enlarged so that it may have a wide expanse of polished floor on which his drafting force and his stenographers may gracefully interpret some symbolic dance while the "chief" sits in a fine frenzy and becomes in a properly receptive mood to evolve some wonderful elements of design.

A Case in Point

WRECKED by fire some years ago, Grace Church in Chicago is now being reconstructed. Designed by Bertram G. Goodhue and acknowledged to be among the most notable examples of ecclesiastical architecture in the middle west, it was logical to assume that its rehabilitation would be at least placed in the hands of competent architects, if not given over to the man who was responsible for the excellence of its design.

What has happened is the entrusting of this important work to a firm of structural engineers whose record is exactly along the lines of their professional announcement and who have not, so far as known, heretofore assumed responsibility for any original work of this character.

Engineering organizations have quite recently passed radical resolutions as to just what were and were not engineering problems and have emphatically sought to lay down a certain law for the edification of the general public and as a rule and guide for the architectural profession. It has been stated in these resolutions that the profession of engineering would regard as a "menace to the public health and safety and the adequacy of a structure purely engineering" if the architects were permitted to dominate the construction of bridges. If such action is consistent, and many architects will dispute that it is, would it not be equally consistent for architects to specifically claim that any phase of ecclesiastic architecture was completely within their field and that the undertaking by engineers of such work as the present example would jeopardize the artistic aspect of the church and very probably its adequacy—we must thank the engineers for that word, adequacy.

JUST how it happened that a commission so purely architectural should be entrusted to structural engineers is not known to us, but we do know something of the strange actions of church building committees. In this case the action of this Grace Church committee would seem to be unmoral. They have

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ignored the just claims of the profession of architecture to work exactly in their line, and have set a very bad example.

We are not criticizing in any way the probable outcome of this action, or seeking to prove that those who have undertaken this reconstruction will not satisfactorily—to their clients—complete the operation, but we are emphatically and adversely referring to the inconsistency of engineers in accepting work that, according to the resolutions of their representative societies, is entirely outside the field of their professional practice.

What would have happened in New York when St. Thomas' in Fifth Avenue was destroyed by fire, if its reconstruction had been placed in the hands of engineers? The present structure, as created by Mr. Goodhue, is one of the architectural beauties of New York.

Inasmuch as the American Institute of Consulting Engineers and the American Society of Civil Engineers have thought it necessary to define work which they regard as predominantly engineering, such as bridges for example, would it not be well for the American Institute of Architects to take similar action with reference to the case at issue?

The Newly Poor

IN his essay on Compensation, Emerson explained certain laws of nature that have been variously called balance, polarity, etc., and by which it was made evident that any situation implied its opposite. An object, for instance, could not be good except insofar as it was not bad. It could not be beautiful unless it had escaped being ugly.

It is doubtless true, that of a given sum of wealth in the world, certain people cannot have too much without certain other people having too little. The "nouveaux riches" have long been a source of amusement, with their suddenly acquired wealth. At the other end of the vista, is automatically produced that opposite class of people whom we might call the "nouveaux pauvres" whom present conditions have knocked off their dignified perch into a social order which they in the past had scorned.

There is an internal revolution bubbling up in the hearts of people whose incomes have not kept pace with rising rents. Those among them who have been unable to buy a house are, many of them, driven to quarters where a much lower standard of living prevails than that to which they have through many years been accustomed. It will not be possible for these individual families perceptibly to influence the poorer neighborhoods of which they thus become a part. Whatever value their presence in that neighborhood develops, it will be a slow process, and one fraught with much sacrifice and difficulty, and growing constantly more so as the effects of their new environment are more insistently felt.

The intermingling of classes would be desirable if the elements of each class were good. But investigation will no doubt show that for some reason, not the better traits, but the less desirable frequently dominate any mixture, as for instance the border peoples between any two countries. Thus we regard with a certain discomfiture the present necessity of the middle classes to be thrown into unfamiliar surroundings among people whose point of view it is difficult for them to appreciate and whose standards of refinements are so radically different from their own.

NO zoning law has distinguished between the types of residents that shall dwell in residential communities. The natural tendency is for each class to herd by itself. In New York there is Little Italy, and Chinatown, and the Ghetto, the Irish section, the German and Greek neighborhoods, each and all going their own way much as they did in their native countries. In some instances, private landlords, without authorization, have excluded negroes, or Chinese, or babies or Jews, or any other group against which they had for some reason a prejudice. All of which results in delayed Americanizing.

The result will probably be that with a continuation of the razing of old houses and the substitution of offices and places of business, Manhattan Island will soon cease to be a residential community. Instead of placing factories in the suburbs where their employees might live close by, the factories are going up on Manhattan Island, and people of old New York who have lived here for generations are buffeted about and driven away, and all that will be left will be developed into what may be called a "clearing house" for incoming foreigners, where they will have to be satisfied with what everyone else has despised until they can fight their way out.

While these things are in process of evolution, the architect can do his part to make the standard of living so good everywhere, that there will be no chagrin on the part of any class to transfer to another social plane.

In the present acute shortage, it would seem only decent that those with any spare room at all should make it available to those less fortunate, for it is the helping through emergencies that is the true test of strength.

TERRACE FRONT

BUXTON HALL, WILLIAMSTOWN, MASS., COUNTRY HOUSE OF ALVAH K. LOWRIE.
JAMES PURDON, *ARCHITECT*
Exterior materials, Germantown stone, Indiana limestone trimmings, balustrades and columns

GARDEN FRONT

BUXTON HALL, WILLIAMSTOWN, MASS., COUNTRY HOUSE OF ALVAH K. LOWRIE
JAMES PURDON, *ARCHITECT*

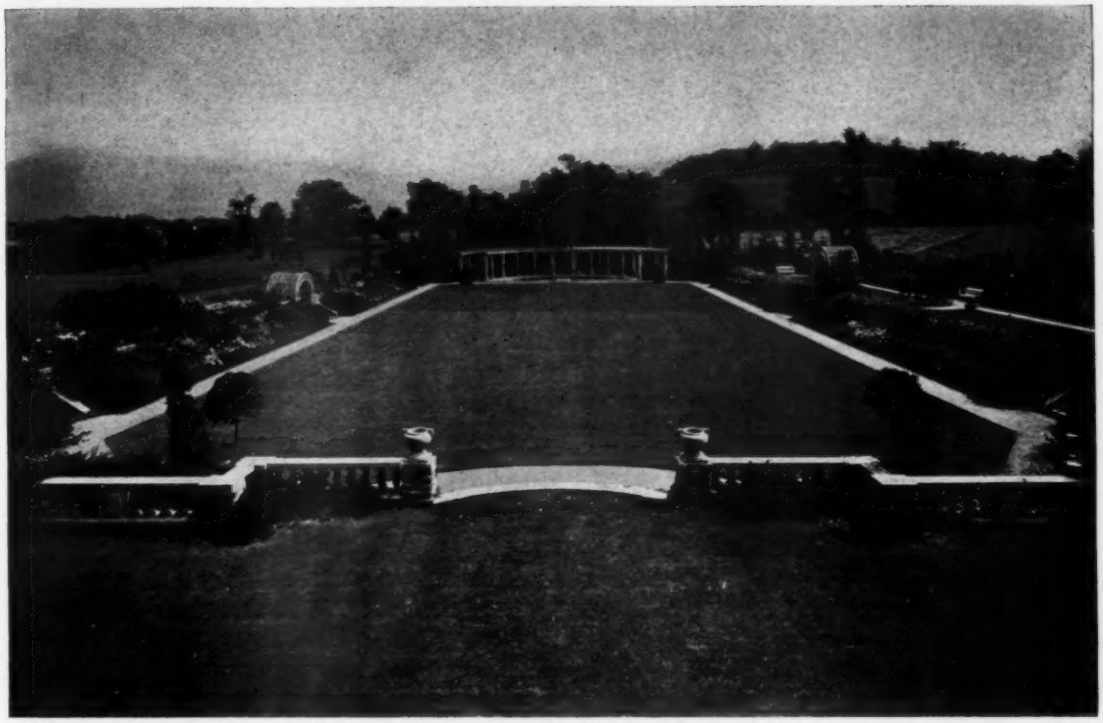
TERRACE FRONT

BUXTON HALL, WILLIAMSTOWN, MASS., COUNTRY HOUSE OF ALVAH K. LOWRIE
JAMES PURDON, *ARCHITECT*

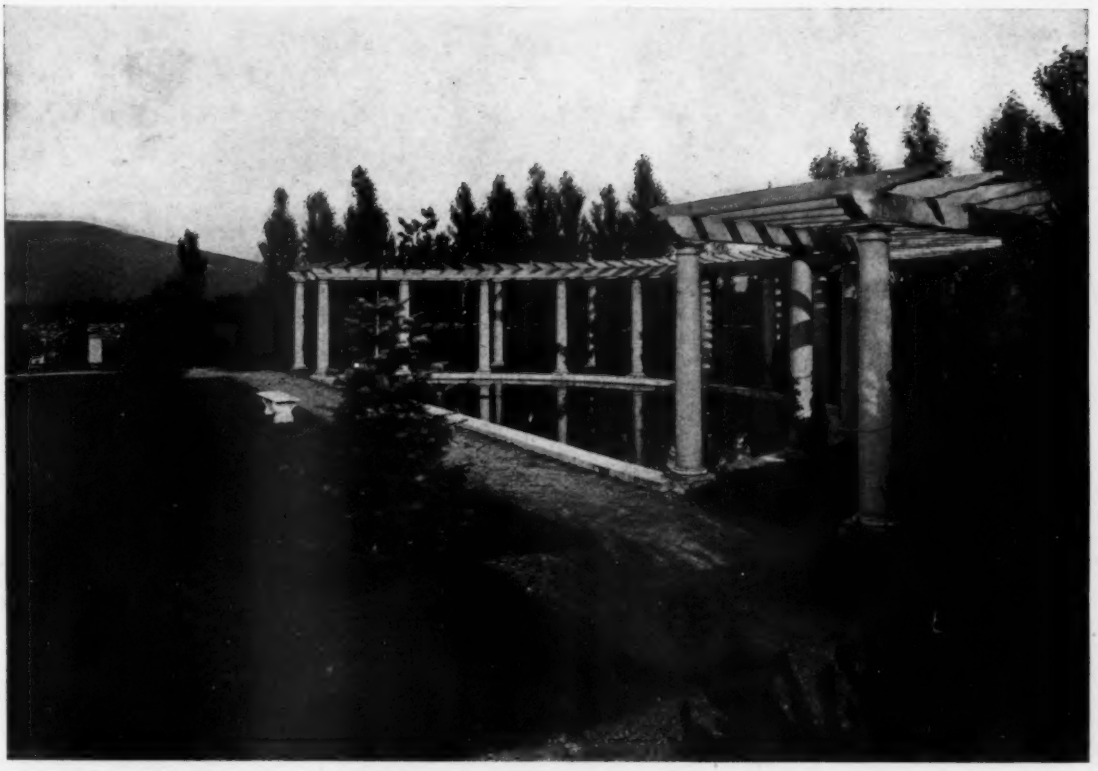
DETAIL OF APPROACH, GARDEN FRONT

BUXTON HALL, WILLIAMSTOWN, MASS., COUNTRY HOUSE OF ALVAH K. LOWRIE

JAMES PURDON, *ARCHITECT*



THE GARDENS



PERGOLA AND POOL IN GARDEN
Note the well arranged planting

BUXTON HALL, WILLIAMSTOWN, MASS., COUNTRY HOUSE OF ALVAH K. LOWRIE
JAMES PURDON, *ARCHITECT*

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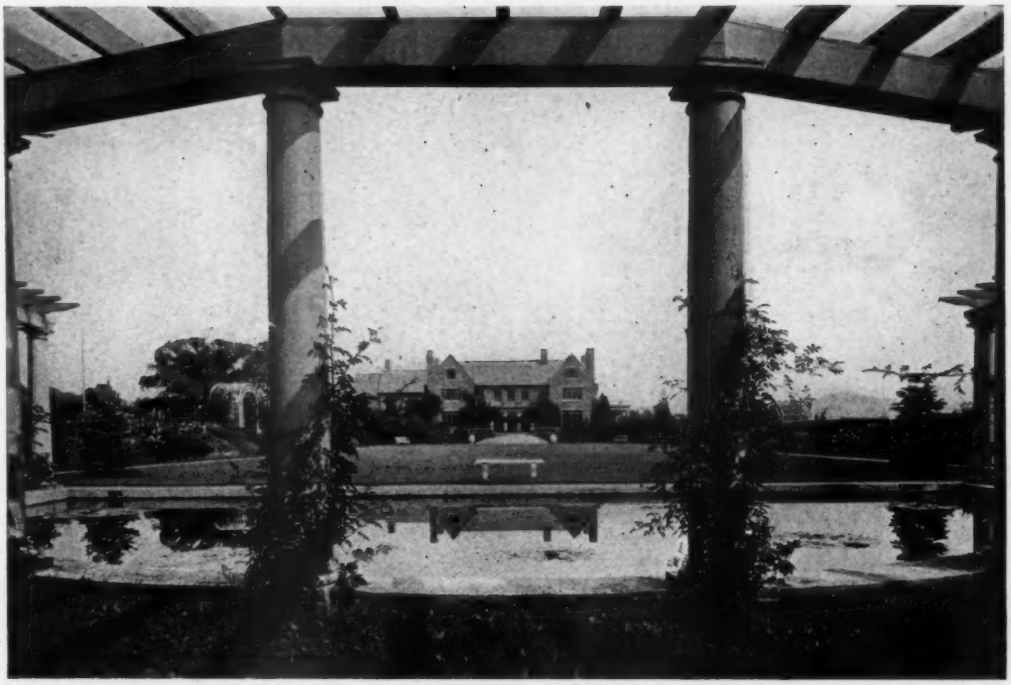
VERANDA



VIEW FROM THE GARDEN

BUXTON HALL, WILLIAMSTOWN, MASS., COUNTRY HOUSE OF ALVAH K. LOWRIE
JAMES PURDON, *ARCHITECT*

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DINING ROOM

DINING ROOM

Paneled whitewood. Has a pearl grey Sienna marble fireplace. Fixtures and andirons are of silver. Grey velour hangings and floor covering

BUXTON HALL, WILLIAMSTOWN, MASS., COUNTRY HOUSE OF ALVAH K. LOWRIE

JAMES PURDON, *ARCHITECT*

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LIVING HALL
Paneled oak walls with old English oak ceiling. The mantle is of carved limestone.

FIREPLACE IN LIVING ROOM

BUXTON HALL, WILLIAMSTOWN, MASS., COUNTRY HOUSE OF ALVAH K. LOWRIE
JAMES PURDON, *ARCHITECT*

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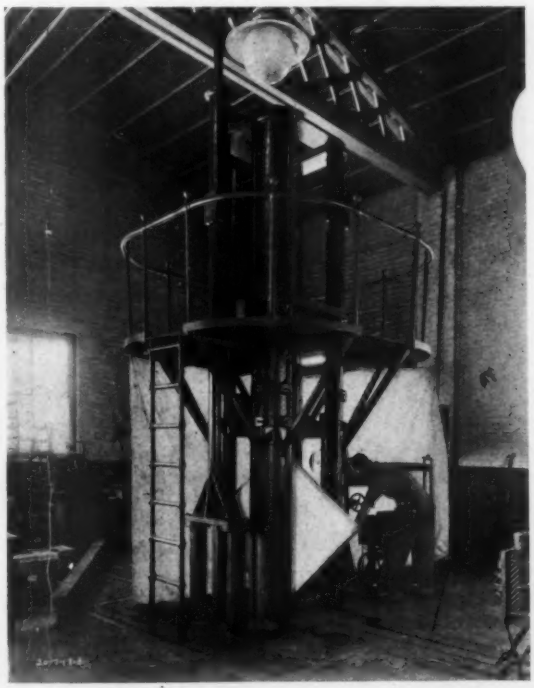
DEPARTMENT OF ARCHITECTURAL ENGINEERING

Results of Additional Distortion Tests on Various Types of Wall Construction

THE report of the testing engineer, Armour Institute of Technology, giving the results of distortion tests conducted in that Institute's laboratory on four different types of exterior wall construction, closely following as it does the report of the tests conducted by the Omaha, Neb., Building Department (published in the August 11 issue) is of particular interest at this time. Some of the wall panels tested were of a construction quite similar to that of the panels in the Omaha tests, and it will be noted that in both series of tests, back plastered construction on metal lath offered the greatest resistance to distortion. Such construction was fully described and illustrated in an article entitled "Successful Building in Stucco" published in the December 17, 1919, issue of THE AMERICAN ARCHITECT.

The report of the tests, conducted by J. F. Peebles, testing engineer, under the direction of Prof. G. F. Gebhard follows:

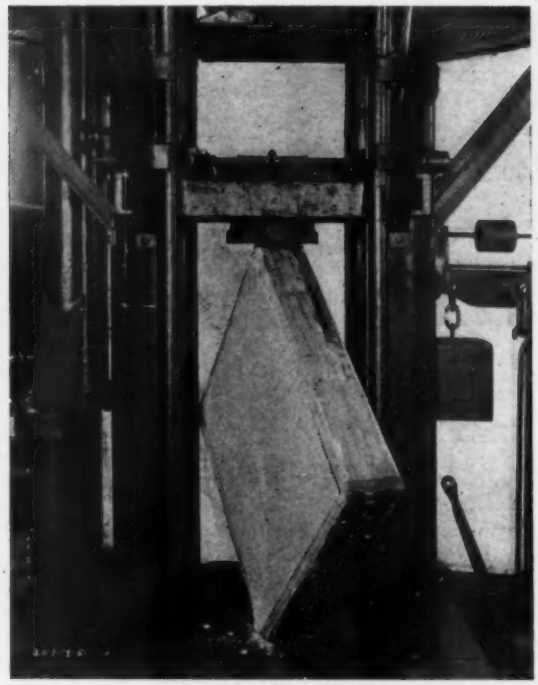
Purpose of Tests.—The purpose of these tests was to secure data in regard to the behavior of the different wall sections when under load, and the strength shown by each to resist such loading. Particularly it was desired to observe the behavior of the inside plastered surface, to note such cracking, crushing or falling away of the plaster as might occur under the load. Similar observations were also made on the stucco in the samples using this type of construction.



CORNER OF TESTING LABORATORY, SHOWING MACHINE USED, ARMOUR INSTITUTE OF TECHNOLOGY

Construction of Panels.—The samples tested conform in detail to the following descriptions:

1. Back-plastered stucco on Metal Lath
   Back-plaster on metal lath furred out by 3/16 in. pencil rods on 2 x 4 in. wood studding with 1 1/16 in. Portland cement stucco on outside, back plastered with 11/16 in. Gypsum plaster, making 1¾ in. from outside surface of back-plaster to outside surface of stucco. On the inside 1¼ in. Gypsum plaster. Each wood stud toe-nailed to sill at top and bottom with two 10 penny nails.
2. Siding and Sheathing.
   Ordinary wood construction, metal lath and Gypsum



WALL PANEL UNDER TEST

plaster 1¼ in. thick on inside, and sheathing and drop siding 1¾ in. thick on outside. Each stud toe-nailed to sill at top and bottom with two 10 penny nails. Each piece of sheathing nailed to each stud with two 10 penny nails, and each piece of drop siding nailed with one 4 penny nail.

3. Stucco on Metal Lath over Sheathing.
   Same as ordinary wood construction except that in place of the drop siding $1\frac{1}{16}$ in. Portland cement stucco on metal lath was used, furred out with 3/16 in. pencil rods laid on ordinary building paper stretched over the siding.
4. Stucco over 6-inch Hollow Clay Tile.
   Six-inch hollow clay tile covered on outside with ⅞ in. Portland cement stucco and on inside with ⅞ in. Gypsum plaster.

Size of Panels. All the samples used in these tests measured 42 x 42 in. outside dimensions. The thicknesses, of course varied, depending upon the character of construction, and were as follows:

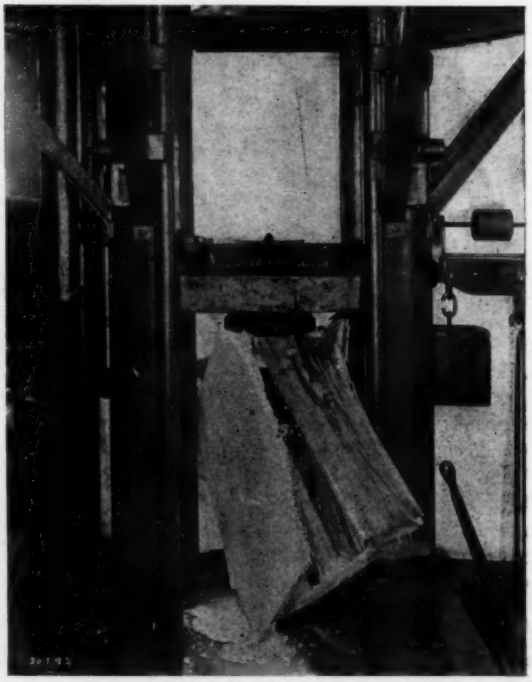
Panel No.	Construction.	Thickness, inches.
1	Back-plastered Stucco on Metal Lath	6 5/16
2	Siding and Sheathing	6¾
3	Stucco on Metal Lath over Sheathing	7 15/16
4	Stucco over six-inch Hollow Clay Tile	7¾

Method of Testing.—In making these tests the sample was placed in an upright position on the bed of the testing machine resting on one of its short edges. The load was then applied vertically downward on the diagonally opposite edge. This is clearly shown in the illustrations. It will be noted that with the sample in this position the studs are not vertical but at an angle of about 45 degrees with the vertical. Thus the studs are not loaded like a long column in compression, but the load is rather a combination of compression, cross bending, and shear. Unless the plastered surface is exceedingly rigid such a stress should produce cracks which would cause the plaster to fall away.

Results of Tests.

No. 1—Back-Plastered Stucco on Metal Lath.—No effect was noted until the load reached 10,000 pounds, at which loading cracks appeared in both plaster and stucco near top and bottom corners of the sample. At a load of 14,200 pounds the sample was destroyed by the failure of the interior framework of 2 x 4 in. timbers. The metal lath was torn from the studs, due to the failure of the latter, but the greater part of the plaster remained unbroken except for cracking and crushing around the edges.

No. 2—Siding and Sheathing.—Plaster slightly crushed at top and bottom corners and a crack produced about 12 in. long near the top corner at a



FAILURE OF WALL PANEL
Note practically undamaged slab of plaster on metal lath

load of 5,460 pounds. Sample destroyed by failure of interior framework at a load of 8,800 pounds.

No. 3—Stucco on Metal Lath over Sheathing.—Small cracks appeared in both plaster and stucco near top and bottom at a load of 9,100 pounds. Sample destroyed by failure of interior framework at a load of 10,800 pounds.

No. 4—Stucco over 6-inch Hollow Clay Tile.—Tile, plaster and stucco crushed at top and bottom corners, and a crack about 15 in. long produced in plaster just above center of sample at a load of 8,000 pounds. Sample crushed so that tiles fell apart at a load of 9,600 pounds.

One point of importance to be noted from these tests is the manner in which the plaster held together, even when the supporting framework was

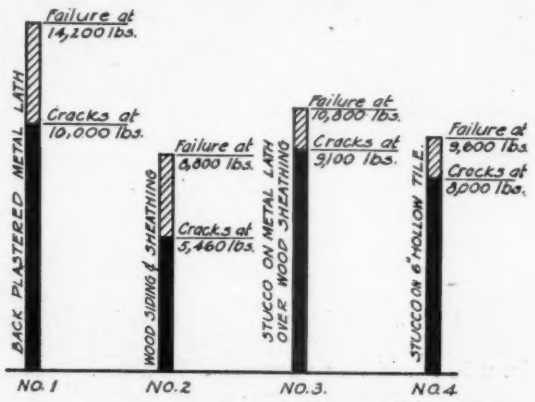


DIAGRAM SHOWING RESULTS OF TEST

completely destroyed. This was noticeable in all the samples tested, and is doubtless due to the monolithic character of the metal lath and plaster construction.

These tests show further that the strength of a wall to resist such load does not depend entirely upon the character of the framework, but is affected to a considerable extent by the nature of the wall surface materials. Note that the only structural difference between sample No. 3 and sample No. 2 of this report lies in the substitution of Portland cement stucco on metal lath in place of the drop siding. A reference to the above results shows that sample No. 3 is considerably stronger than sample No. 2, thus indicating that stucco on metal lath has greater structural strength than the siding.

Further, the back-plastered construction comprising back-plastered stucco having a total thickness of 1¾ in. on the outside of the wall and Gypsum plaster 1¼ in. thick on the inside, shows greater strength than any of the others, although the interior framework is the same as that for samples Nos. 2 and 3. This increase in strength is due to the monolithic character of the stucco and plaster and to the absence of wood in the wall surface.

(Signed) J. C. PEEBLES, *Testing Engineer.*

The results of both this and the Omaha series of tests demonstrate the superiority of back-plastered metal lath construction to metal lath over wood sheathing. There seems to be no logical reason, where stucco on metal lath is to be used, for sticking to the older (metal lath over wood sheathing) but less satisfactory type. The tests conducted by the U. S. Bureau of Standards show the back-plastered type to be the best from a weathering standpoint, and it is equally if not more fire resisting. As to the question of thermal conductivity, tests so far made indicate excellent insulation if a layer of good weather proof paper is used or two layers of common builders' paper. As compared with the usual type of frame wall construction, it has many points of advantage both from the constructional and fire resisting standpoint.

While a hollow tile panel was included in this test, and such construction is not directly comparable with that using a timber framework, yet it is interesting to note that this masonry construction, loaded on the diagonal, resisted a load 50% greater than the frame wall type before showing cracks.

New Type of Glass Shows Remarkable Resistance to Shock

IN view of the great extent of broken glass resulting from the recent bomb outrage in Wall Street, renewed interest is being manifested in "shock proof" glass. Wire glass is quite familiar to us all, but has been found unsuitable in many locations where clear plate glass is customarily used. While due to its extra cost, it is not likely that any of the types of unbreakable glass so far developed will find extended use throughout a building, but there are certain locations where the extra cost would be warranted. This applies particularly to banking houses, show windows of jewelry stores, etc.

Recently some tests conducted by the New York City Police Department on a bullet proof glass have shown very satisfactory results. In response to a request for information relative to these tests, Joseph A. Faurot, Third Deputy Police Commissioner, writes us as follows:

"I would state that this product has been demonstrated to me in a shooting gallery, where four 45-calibre steel jacket bullets were fired point blank at a slab of Bullet Proof Glass from an army automatic pistol. The bullet failed to penetrate the glass and rebounded. As a result of this test, I can unhesitatingly say that this glass is absolutely proof against any revolver or pistol shot that may be fired at it."

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Short Cuts to Accurate Calculations

Timber Beams and Steel Girders

By E. I. Freese.

WHILE, with the aid of handbooks, it is possible to determine the size of beams and girders without going through intricate mathematical calculations, yet the time consumed in hunting up the data, reading over the explanations for use of tables, formulae, etc., is often as great as that required to make the necessary calculations. In order to provide, in concise form, the data necessary for all usual calculations, four tables are here presented. Their correct use in solving problems commonly confronting the architect will be demonstrated in the solution of several problems.

Conditions of Loading.—The types of beam and girder loadings encountered in building construction are termed either concentrated or uniform. Any load applied at one particular point is said to be concentrated, such as that transmitted from a header to a trimmer beam. The uniformly distributed load is the one assumed to occur in most cases. Floor beams are considered as supporting a uniform load. Under certain conditions a beam or girder may be subject to both kinds of loads. The weight of the beam itself must always be considered as a uniform load.

Bending Moment.—The application of a load to a beam produces a bending moment, which is a measure of the bending tendency produced by the load. Eight conditions of loading are shown diagrammatically in Table 2 and the corresponding formulae for computing the value of the bending moment produced thereby, given. The bending moment is resisted by the beam, the total resistance which it can offer being the product of the section modulus and the ultimate strength per square inch of the material against rupture from bending.

Allowable Safe Working Stress.—All loaded beams are subject to stress, and, when the material of the beam becomes stressed beyond its endurance, the beam fails. The stress at time of failure is termed the breaking or ultimate stress, which, divided by a "factor of safety," gives the allowable safe working stress of the material. This working stress is always given in pounds per square inch, and its amount is represented by the letter F. Table 1 gives the safe working stresses for steel and all kinds of structural timber, based on a factor of safety varying from 4 to 6, which is in accord with good engineering practice. For instance, if the beam be of steel, F = 16,000 pounds per sq. inch; the safe stress. Or, if the beam is to be of Oregon pine, F = 1,200 pounds per sq. inch; the safe stress.

Most building codes specify the safe stresses to be used for all structural materials. Where no building code is in effect, the value as given in Table 1 should be used.

Section Modulus.—The section modulus of a beam is a purely geometrical quantity that determines the shape and size of the beam. It is represented by the letter S, and its required value can readily be found by dividing the bending moment of the beam (M) by the safe working stress of the material (F). Hence, the section modulus (S) is given by the following easily remembered formula:

$$S = \frac{M}{F} \qquad (1)$$

Two practical examples will now be worked out so as to render clear the process of application. It is to be remembered that the following method of procedure is the same in all cases, whether for timber or for steel, and whether for concentrated loads or for distributed loads, or both.

Example No. 1.—A timber girder 16 feet long is required to span across a basement room. It must support the floor joists which rest upon it as well as a first-story non-bearing partition. The joists are 2 in. x 10 in., 16 in. on centers. The floor is double, and the basement ceiling is to be plastered. The floor area to be supported by the girder is 200 sq. feet. The live load is to be taken at 40 pounds per sq. foot. The partition to be supported is the full length of the girder, 8 ft. high, of 2 in. x 4 in. studs, plastered on both sides. What size girder will be required if the timber is long leaf yellow pine?

Solution.—*First,* calculate the total load which, in this case, is uniformly distributed. The floor area, carried by the girder is 200 sq. feet. The dead load will be taken at 20 lbs. per sq. foot, which added to the live load gives a floor load of 60 lbs. per sq. foot. Thus the total floor load will be 60 x 200 = 12,000 pounds.

The partition is 8 feet high, so that the partition area carried by the girder is 8 x 16 = 128 sq. feet. Taking 22 pounds per sq. foot as the weight of the partition, the total partition load will amount to 22 x 128 = 2,816 pounds.

The entire load on the girder will then equal the sum of the above two loads, or 12,000 + 2,816 = 14,816 = W, the total uniformly distributed load (in pounds) to be supported by the girder.

Second, from Table 2 find which case of loading the girder comes under. It is found to be Case 6,

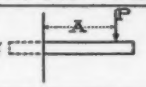
TABLE·1· GIVING THE ALLOWABLE SAFE WORKING STRESS F IN LBS. PER SQ. IN., FOR STEEL & TIMBER BEAMS.

Steel	16000
Long Leaf Yellow Pine	1500
Oregon Pine	1200
Oak	1200
Spruce	1200
Fir	1200
Short Leaf Yellow Pine	1000
White Pine	1000
Hemlock	900
Redwood	800

NOTE: This table shows the value of F to use in the calculations of Table #2 for finding the Required Section Modulus, S, for a beam of the given material. If a local bldg. ordinance is in effect, then the allowable safe working stress, F, as therein specified for the given material, must be used in place of the value for same given in this table.

TABLE·2· SHOWING HOW TO CALCULATE THE REQUIRED SECTION MODULUS, S, FOR ANY BEAM UNDER ANY GIVEN CASE OF LOADING.

CASE·1· Overhanging beam carrying only a load, P, concentrated at any given point.

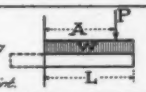


$M = P \times A$. $S = \frac{M}{F}$.

CASE·2· Overhanging beam carrying only a load, W, uniformly distributed.

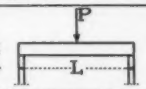
$M = \frac{W \times L}{2}$. $S = \frac{M}{F}$.

CASE·3· Overhanging beam carrying both a load, W, uniformly distributed, & a load, P, concentrated at any given point.



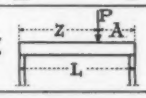
$M = P \times A + \frac{W \times L}{2}$. $S = \frac{M}{F}$.

CASE·4· Beam supported at each end & carrying only a load, P, concentrated at the center.



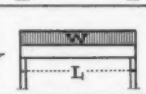
$M = \frac{P \times L}{4}$. $S = \frac{M}{F}$.

CASE·5· Beam supported at each end and carrying only a load, P, concentrated at any given point.



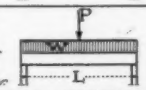
$M = \frac{P \times A \times Z}{L}$. $S = \frac{M}{F}$.

CASE·6· Beam supported at each end & carrying only a load, W, uniformly distributed.



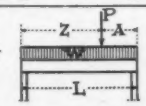
$M = \frac{W \times L}{8}$. $S = \frac{M}{F}$.

CASE·7· Beam supported at each end & carrying both a load, W, uniformly distributed, & a load, P, concentrated at the center.



$M = \frac{P \times L}{4} - \frac{W \times L}{8}$. $S = \frac{M}{F}$.

CASE·8 Beam supported at each end & carrying both a load, W, uniformly distributed, & a load, P, concentrated at any given point.



Use the GREATER of the following two values of M, for finding S:

$M = \frac{W \times A \times Z}{2 \times L} + \frac{P \times A \times Z}{L}$

$M = \frac{A \times A \times P \times P}{2 \times W \times L} + \frac{A \times P}{2} + \frac{W \times L}{8}$

NOTE: In above formulas, the letters stand for the following values:- P = the total concentrated load, in POUNDS. W = the total uniformly distributed load in POUNDS. L = the total length of beam, in INCHES. A & Z are distances in INCHES. M = the maximum bending moment, in INCH-POUNDS. F = the allowable safe working stress, in POUNDS PER SQ. INCH, either as given in Table #1 or as fixed by local building ordinance. S = the REQUIRED Section Modulus of the beam, found by dividing M by F. The size of beam is then found by looking in Table #3 or #4, for a beam that has a GIVEN Section Modulus equal to, or greater than, the REQUIRED Section Modulus. Use Table #3 for TIMBER beams, & Table #4 for Steel I-BEAMS.

$S = \frac{M}{F}$.

SHORT CUTS TO ACCURATE CALCULATIONS

Tables for use in determining size of timber beams and steel girders for various conditions of loading

TABLE·3·

GIVING THE SECTION-MODULUS, S, OF ALL TIMBER BEAMS FROM 2"×3" UP TO 20"×24".

Size of beam is in inches.

b = the breadth "
d = the depth "

EXAMPLE: Suppose a beam requires a section modulus of 165. Look along the rows marked S and stop when 165, or the next higher value, is reached. In this case, the staggering point is 166. Then, the size of beam given for 166, or any other size beyond this, can safely be used — either the 10"×16", 12"×16", 8"×12", 6"×14" etc. In this case, the 4"×16" should be used, if conditions permit, because it contains the least lumber, & has the greatest DEPTH. The 4"×16" will therefore be the most economical, as well as the STIFFEST, to carry the given load.

SECTION MODULUS S	3.0	4.5	5.3	8.0	10.6	12.0	18.0	21.3	24.0
SIZE OF BEAM b×d	2×3	3×3	2×4	3×4	4×4	2×6	3×6	2×8	4×6

S	32.0	33.3	36.0	42.6	48.0	50.0	64.0	65.3	66.6
b×d	3×8	2×10	6×6	4×8	2×12	3×10	6×8	2×14	4×10
S	72.0	85.3		96.0	98.0	100.	108.	128.	130.
b×d	3×12	8×8 or 2×16		4×12	3×14	6×10	2×18	3×16	4×14
S	133.	144.	162.	166.	170.	192.	196.	200.	216.
b×d	8×10	6×12	3×18	10×10	4×16	8×12	6×14	3×20	4×18
S	240.	256.	261.	266.	288.	322.	324.	326.	341.
b×d	10×12	6×16	8×14	4×20	12×12	4×22	6×18	10×14	8×16
S	392.	400.	426.	432.	457.	484.	512.	533.	540.
b×d	12×14	6×20	10×16	8×18	14×14	6×22	12×16	8×20	10×18
S	576.	597.	645.	648.	666.	682.	756.	768.	800.
b×d	6×24	14×16	8×22	12×18	10×20	16×16	14×18	8×24	12×20
S	806	864.	933.	960.	968.	972.	1066.	1129.	1152.
b×d	10×22	16×18	14×20	10×24	12×22	18×18	16×20	14×22	12×24
S	1200	1290.	1333.	1344.	1452.	1536	1613	1728.	1920.
b×d	18×20	16×22	20×20	14×24	18×22	16×24	20×22	18×24	20×24

TABLE·4·

GIVING THE SECTION MODULUS, S, OF STANDARD STEEL I-BEAMS.

SECTION MODULUS S	DEPTH d	WEIGHT PER FOOT
3.0	4"	7½#
4.8	5"	9¾#
7.3	6"	12¼#
10.4	7"	15#
14.2	8"	18#
18.9	9"	21#
24.4	10"	25#
36.0	12"	31½#
58.9	15"	42#
88.4	18"	55#
117.0	20"	65#.
173.9	24"	80#

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which indicates a "beam supported at each end and carrying only a load, W, uniformly distributed."

Third, calculate the bending moment, M, by solving the formula for same. $M = \frac{W L}{8}$ given with this case of loading.

As already determined, W = 14,816 lbs.

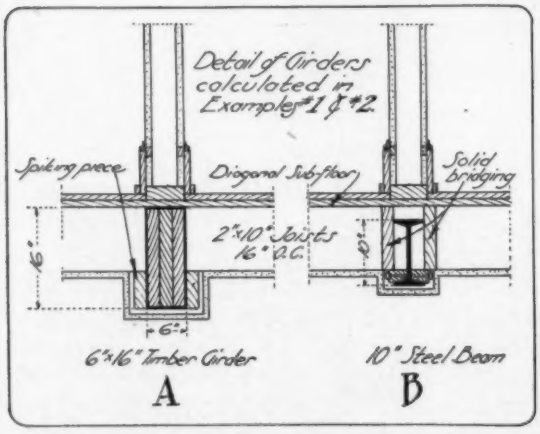
L = 16 x 12 = 192 inches, the total length or span of the girder.

By substituting these values in the above formula, and solving, we get

$$M \text{ (the bending moment)} = \frac{14{,}816 \times 192}{8} = 355{,}584$$

inch-pounds.

Fourth, from Table 1 find the safe allowable working stress of the material. In this case, the girder is to be of long leaf yellow pine. Hence, from Table 1, F = 1,500 pounds per sq. inch.



CONSTRUCTION DETAILS, ILLUSTRATING PROBLEMS 1 AND 2

Fifth, calculate the required section modulus, S, by solving formula (1).

Since M = 355,584 inch-pounds, and F = 1,500 pounds per sq. inch, by substituting these values, we get

$$S = \frac{355{,}584}{1{,}500} = 237$$

the required section modulus for a timber beam.

Sixth, consult Table 3, of timber beams, and select one having a section modulus equal to or greater than 237. It is found that a 10 in. x 12 in. timber is the first one in the table to meet the requirement. Hence, either this one, or any other one that has a section modulus greater than 237, can safely be used as far as *strength* is concerned. However, in this case, *deflection* must also be taken into account, for the girder is to carry a plastered ceiling. Moreover, the deeper a girder is to carry a given load, the less lumber will it contain, and consequently greater economy is attained. Hence, the choice should always be given to the girder that has the least number of sq. inches in its cross section, provided that its section modulus is at least equal to that required. Again consulting Table 3, it is found that, of all the beams therein having a given section modulus greater than 237, the 4 in. x 20 in. beam has the least cross sectional area. If this cannot be obtained, since it is a rather odd size, then the 6 in. x 16 in. or the 8 in. x 14 in. should be given preference over the 10 in. x 12 in., since all three of the deeper beams contain less lumber, and have a greater section modulus, than the 12-inch beam, and, therefore, would be more economical, stiffer and stronger, than the latter. Of course, the matter of head room must also be given consideration. The 6 in. x 16 in. girder will be assumed to have been decided upon, and a detail of same is given at "A" in the accompanying sketch.

EXAMPLE 2.—What size steel beam would be required to take the place of the timber girder in the first example?

SOLUTION.—The bending moment will be the same as found above, because the load is the same. Hence, it is only necessary to find the required section modulus for steel.

Looking in Table 1, it is seen that the safe allowable working stress for steel is 16,000 pounds per sq. inch. Hence, in this case, F = 16,000, and M = 355,584. By formula (1) the required section modulus S is:

$$S = \frac{355{,}584}{16{,}000} = 22.2$$

Consulting Table 4, it is seen that there is no standard steel beam having a section modulus of 22.2, so that the next *higher* value of 24.4 must be used, which calls for a 10-inch, 25-pound I-beam. This steel beam could be used in place of the 6 in. x 16 in. timber girder of example 1. A detail of the steel beam is also given at "B" in the accompanying sketch.

By adhering to the above method of design, one will have no difficulty in calculating the size of any timber beam or steel girder, for any condition of loading given in Table 2.

A Further Discussion of Improved Contract Forms*

By Louis Cowles

At present there are at least five quite different forms of contract in use for building work, commonly termed the "Lump Sum Contract," the "Percentage Contract," the "Cost Plus a Fixed-Sum Contract," the "Emergency Contract" and the "Cost Plus Fixed Sum With Bonus or Penalty contract."

After years of experience, much inquiry among builders and careful study of each of these forms, we believe the last named is by far the best for use, at least during the period of uncertainty in which we now find ourselves. Various advantages and objections will be later pointed out, but it is first necessary to have a clear conception of the Cost Plus Fixed Sum With Bonus or Penalty Contract.

First, fully complete plans and specifications must be worked out to provide accurate information to all bidders as to the kinds, qualities and amounts of the work to be done. Then, by the best practice, a full "Bill of Quantities" is made out, so that all bidders shall work on the same basis, simply adding their prices in detail and footing up the totals. This practice removes the main source of the common omissions, mistakes and other variations in bids, which in the past have differed surprisingly, even up to 100 per cent on the same building.

By this plan, bids received will show less variation and other very important matters can be more fairly judged, such as the character, ability and other qualities of the contractor to be chosen.

In order that all bidders shall know from the start, what the form of contract is to be, the following clause is incorporated in the specifications

Every bid shall state a fixed sum (aside from net costs) for which the contractor will execute the work complete (as indicated by plans and specifications); this sum to be his sole compensation for his part in the work and the use of his organization and equipment, not to be augmented by commission, discount, rebate or other profit, hidden or known.

Every bid shall also include a careful estimate of the net cost of the work to the contractor (aside from his organization and equipment). This estimate and bid shall consist of (or be accompanied with) complete bills of quantities with prices of materials and labor attached, to be used for reference by contractor and owner or architect, to facilitate part payments and settlements, or any changes, and to help keep account of actual costs.

Then it is provided that if the actual cost of the work is *less* than the estimate, the difference saved shall be divided between the owner and contractor, in the proportion of one-third to the contractor and two-thirds to the owner. Also, if the actual cost is *greater* than the estimate, the excess shall be borne by owner and contractor in like proportions, the contractor's share being deducted from his fixed sum compensation mentioned above.

This feature applies to each separate general contract. It also applies to each sub-contract as between the sub-contractor and his general contractor.

If any contractor with his men or any of them, choose to organize a co-operative plan under the same rules, for doing any of his contract work, it is very likely to be approved and encouraged by the management. The main purpose of this arrangement is to bring about actual friendly co-operation in mutual confidence and helpfulness, in place of opposition of individual interests.

It is provided that if the costs be increased by fault of contractor or his men, such as neglect, carelessness, known willful act, continuous loafing or correction of faulty work, he shall bear the loss due to such fault without the owner sharing it.

It is also provided that if the cost is increased by fault or act of the owner, such as failure to pay installments as due which were agreed upon, or changes after work affected is under way, or unreasonable delay in deciding what to do, the loss due to this condition shall be borne by the owner without the contractor sharing it.

Daily or frequent reports of work done, with its cost, made to owner or his agent, are required as a check on any trouble liable to arise, before details and circumstances are forgotten.

FORMS of contract for building work are now under intensive study and discussion all over this country and in Europe, in architectural and building magazines, in societies and gatherings of

*[Editors' Note:—In an article entitled "Formulating Improved Contract Forms" which appeared in the June 9 issue of The American Architect, an extract from a contract form used by the office of Louis Cowles was quoted, as well as resolutions adopted by the National Association of Building Trades Employers. In a subsequent communication to the Editors, Mr. Cowles stated: "In thinking over the resolutions adopted by the National Association of Building Trades Employers, it occurs to me that their effect would be to put upon the owner alone all the risks and burden of any rise in prices, leaving the contractor in a don't care attitude. Would it not be much better on the whole for them to share this burden between them especially considering that the contractor is usually far better trained, qualified and situated for watching market conditions, changes and prospects, and buying to advantage? This is a very important part of a contractor's service to an owner. The owner cannot afford to dispense with it, neither can the contractor in the long run, afford to relinquish this service to the owner. It is vital to the principle and the spirit of co-operation in such an enterprise." His reasons for advocating the form of contract known as the Cost Plus a Fixed Fee with Penalty or Bonus clause are set forth in the article by him, published herewith. It is believed that a discussion on the important subject of contract forms will prove of mutual benefit and the views and experiences of other architects are solicited by the Editors.]

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representative building men, in the newspapers and between persons interested.

The old form of "Lump Sum" contract, although for fifty years a bar to worse evils, has been the instrument of an immeasurable amount of damage, sometimes resulting in ruin to good builders, to owners, to sub-contractors and to material men. Its evils, under certain unfavorable circumstances, became so notorious, that with no guarantee as to prices of labor and material, many good men quit the building business in despair while many owners and officials regarded the business with aversion.

During and subsequent to the War, the old lump sum contract passed—or more correctly speaking, is very generally passing out of use all over the country, as well as overseas, while other forms of contracts have come into use. These all claim to have special merits and various degrees of improvement over the older form, but it is believed by the author that the best is the form described herewith. It seems to include the merits of all others, while being free from their objections, and its adoption makes possible the important advantages of co-operation. Under it the purposes and interests of owner and contractor are the same, namely, to carry out the plans in the most efficient manner possible. There is nothing to be gained by scheming or "bucking" each other.

Under the lump sum contract large amounts of time and effort are required by the owner and architect on one side in watching, striving and often fighting to get the contractor to perform the work as planned, while he on the other side was scheming and squirming and camouflaging to squeeze out a profit or at best a poor living. Under such conditions the best work is impossible of realization.

The following quotation is from Mr. W. H. Hall of San Francisco, commenting on the form of contract advocated:

> The best system does not tend to make gamblers of contractors, nor conduce to 'skinning' of work, as the lump sum system does. It does not conduce to under-estimating, or to running up the cost of work, as the percentage system does. It does not conduce to neglect of the work, as the percentage and cost plus fixed sum systems do. It does not conduce to antagonism between owner and contractor or architect and contractor, as all the other systems do.
>
> This system puts a premium on good faith, energy and special ability in the contractor, for the owner's benefit as well as the contractor's profit, and it puts a penalty on bad faith, neglect and incompetency in the contractor, for the owner's protection. But it does not penalize the contractor for what he cannot reasonably fore-see, nor beyond the limit of his profit in any ordinary case.
>
> The principle of this system of contract agreement is distinctly right, in the honest interest of all concerned.
>
> All that can be said against it is that its application may be inconvenient in some cases and under some business conditions.

It may call for more work in accounts, by owner or some one representing him. It gives opportunity for as much interest and watchful care as the proper officials choose to give to the work as it goes along. Improvements can be made or items eliminated without impairing the contract or exciting antagonism. This is especially the case when all "quantities" are carefully estimated beforehand, with detailed prices attached.

THE resultant benefits need not necessarily stop with owners and contractors. When workmen begin to see and realize these improved conditions, and feel even a little of the stimulating good spirit of helpful co-operation which this plan is adapted to call out, there should be some degree of relief from the feelings of resentment from being driven, exploited, impoverished and suppressed, or discharged on a triviality. Seeing the opportunity to share in more and better work, they will feel encouraged to do so and derive the benefits as well as to help guard against losses which they will share if they fail to do their best.

We should see some speeding up, now so sorely needed, more interest and more pride in quality of results, more sense of responsibility and a growing unity of feeling and effort for the welfare of all, and a reduction in the causes of strikes.

Opinions may differ on the fairest proportion to use in sharing of savings or losses. Half and half is often specified and seems proper for small contracts. If, however, excess costs come to 20 per cent. of the estimated cost, the contractor would lose his 10 per cent. compensation.

On the other hand, in a recent article appearing in an eastern magazine, it was urged that whatever percentage the saving or loss is of the whole estimated cost be used; that is, if contractor saves (or loses) say 10 per cent. of estimated cost, then he gains (or loses) 10 per cent. of that saving (or loss), the other 90 per cent. going to the owner. On a school estimated at $100,000, for a saving of $100, which is one-tenth of 1 per cent. on $100,000, he would have ten cents for his extra care—too trivial for a second thought. So this rule clearly is inadequate for small amounts.

Somewhere between these extremes the best proportion should lie. Since the owner bears the greater burden of cost and also receives the greater benefit in the finished building, he should have the greater proportion of saving or loss.

In view of all these factors, it would seem most fair and equitable to provide a sharing of two to one, i. e., two-thirds for owner and one-third for contractor, the latter gaining one-third of all savings or losing one-third of all extra costs. This should prove an effective incentive for him to do his best in either case, and it eliminates excessive gambling risks.

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Current News

Happenings and Comments in the Field of Architecture and the Allied Arts

The Liner Engineer

Under the above title, the *Western Architect* for September, publishes the following well merited appreciation of a most efficient officer of the Institute. The editors of THE AMERICAN ARCHITECT, having also with much pleasure observed the efficient activities of Mr. Kemper, take pleasure in giving further publicity to this article:

The *Western Architect* states:

The convention reports that have of late occupied a measure of attention in the architectural press reminds one of the central figure, the liner engineer in that superb and technical poem of Kipling's, in which the passenger after reaching port thanks the officers on deck from captain to cabin boy for contributing to a successful voyage, and forgets the engineer, without whose constant watchful care the ship would have lain "a log upon the sea." As it is too common for the architect to receive the owner's praise and his "clerk-of-works-superintendent, draftsmen, et al, overlooked, so it is not strange that the understanding, constant and faithful activity of the executive secretary should be passed unnoticed. Yet it is not too much to say after close observation, that the smoothness with which the business of the convention was carried through was owing, not to the captain-secretary and his deck-crew, but to the silent, assiduous and most capable engineer below decks at the Octagon. His work, most noticeable at the end of the voyage when the convention-dock is made, is most effective during the long year passage when his "purring dynamos" are most active in carrying out the details of Directory and Committee, directions that center at headquarters. Mr. Kemper this year received the thanks of the convention. He has earned the approval of all who have noted the order and capability in general that has distinguished his prompt and efficient executive service at the Octagon.

Competition for Memorial Design

Gen. William J. Nicholson, vice-president of the Army and Navy Club of America, has announced the names of the committee of architects who will select the design for the three million dollar memorial clubhouse to be erected in New York City as a tribute to the officers who died in the war. The committee, to which the leading architects of the country will be asked to submit competitive drawings, is composed of Charles Dana Gibson and Edwin Howland Blashfield, artists; Henry Bacon and Benjamin W. Morris, architects, with Admiral Bradley A. Fiske, president of the club, as chairman. A meeting of the committee will be called soon to go over the tentative plans for the contest and formulate a statement on specifications.

The memorial club building will be centrally located and will serve as a monument to the military leaders who died, and as a home for living officers, active or retired, in all branches of the service. Leaders in civilian life are eligible for associate membership.

"It is probable that the memorial feature will take the form of a central court, with bronze paneled walls, where the names of those who made the supreme sacrifice will be engraved," Gen. Nicholson said.

"For practical clubhouse purposes many interesting features are under consideration," he continued. "Thousands of officers annually pass through New York City and for their accommodation the building will contain at least 400 bedrooms. There also will be a large assembly hall and smaller rooms for meetings of patriotic societies as well as other usual conveniences found in a modern clubhouse. A ladies' dining room and reception room will be provided for the relatives of members or relatives of the dead who come to this city to see the memorial."

The club recently broadened its scope so as to include in its membership all officers, ex-officers and all commissioned men in the Allied armies during the war, numbering approximately 200,000.

Opportunity for Bridge Builders

Owing to the general destruction of bridges during the war there is an exceptional opportunity in Roumania for American bridge builders. A bridge over the Danube to connect Roumania with Serbia is being considered by the Roumanian government. There are eighteen important bridges in other parts of Roumania awaiting reconstruction. In addition, the great bridge over the Danube at Cernavoda, in many respects the greatest structure in Europe, must be reconstructed. This bridge, known as the King Carol Bridge, is 1,260 feet long and 11.4 feet above high water.

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Kaiser's Home Used

In the Berlin Schloss, the former Emperor William's town residence, on the banks of the Spree, is now installed the Psychological Institute of the University of Berlin. Scaffolding is still up, and workmen are leisurely repairing the front, which was badly scarred in parts by machine-gun fire at the time of the revolution.

Chicago to Rebuild Fort Dearborn

Plans are being made in Chicago to reconstruct historic Fort Dearborn at Eighteenth street and Lake Michigan as a permanent educational exhibit.

In addition to the stockade, it is proposed that the homes of the earliest settlers of Chicago, or "Fort Dearborn," shall be rebuilt. The work will be done under the direction of Chicago's First Families.

Alaska Has Museum

Alaska's first museum is being completed in Juneau to house several thousand articles from all parts of the territory. One big exhibit to be brought to the museum from Washington, D. C., was on display at the St. Louis World's Fair. Another exhibit, to be loaned to the museum by Dr. Daniel S. Neuman, is considered the most complete collection of Eskimo curios in existence. The territorial government is building the museum.

Peru Spends $30,000,000 This Year for Building

Contracts for construction in Lima, Peru, of dwellings, churches, office and other buildings costing nearly 30 million dollars, have been let to the New York contracting firm that built Camp Devens, Ayer, Mass. The firm announced today that contracts already signed amounted to more than one million dollars. The Peruvian work, which a member of the firm described as "a sort of housing and reconstruction project," is being financed by the Roman Catholic Church of Peru. It is to be finished within a year and to assure its completion within the allotted time a force of engineers and workmen is being sent to South America.

Town Burned to Be Rid of Rats

Tens of thousands of rats which infest the town of Paita, Peru, caused the Peruvian Government to order the town destroyed and rebuilt in a ratproof manner, according to William Moss, who recently returned from South America.

Yellow fever is raging in some districts of Peru, Mr. Moss reported. The town of Paita, with 5,000 population, has been particularly hard hit, scarcely a family escaping the ravages of the disease. The advent of swarms of rats caused fear that bubonic plague also would develop and the government ordered the town evacuated, the people going to the outskirts and living in tents.

All the buildings will be burned, the rats exterminated and new sanitary homes constructed, he said.

House Shortage in Paris

Following a law passed during the recent session of Parliament, the city of Paris has ceded 7,000 square metres of land in its suburbs to the Government for the construction of a total of 346 apartments to relieve the housing problem which still is very serious. The bill provided for an expenditure of 25,000,000 francs for building. The lodgings will be let at popular prices.

According to official figures the population of Paris has increased 6,000,000 since 1914, of which number approximately 400,000 were refugees. There has been practically no construction of houses since the beginning of the war. Landlords seem to raise rents to a staggering height. The courts are continually occupied with cases of rent profiteering. While awaiting the construction of the new buildings the public office of housing will erect temporary structures in the suburbs to care for immediate needs.

Museum Unearths Old Glass

After digging in a field near Alloway, N. J., three members of the staff of the Pennsylvania Museum have obtained a thousand specimens of the glass that was the first to be manufactured successfully in this country. The field in which they dug was once the site of the old Wistar Glass Works, founded nearly 200 years ago by Caspar Wistar, who was of Austrian extraction and titled. At present there is not a trace of the industry or the buildings.

The specimens found were for the most part fragments of bottle and window glass, of which there have not been many specimens until now. The museum is now making a study of the types of glass that were produced in the early days of Pennsylvania and New Jersey. The first glass to be manufactured in this country was that of a Virginia company located at Jamestown, but the first produced successfully was that of Alloway, then known as Wistarburg.

Advantages of a Cement Lawn, Painted

A lawn that is not a lawn, but looks like a lawn and is said by its owner to be better than a lawn—a waterless, mowerless, weedless, lawn—in short, a cement "lawn," painted grass green, has made its appearance in front of a Los Angeles bungalow.

Mrs. A. C. Woodward, inventor and owner, says it saves time, money and worry. She never has to water it; she never has to weed it; she never has to cut it; it is always dry enough to sit on—and it needs painting only once a year.

She has circular holes cut through the lawn and in them and along the edges she has flowers planted.

She invented the cement lawn because of difficulty experienced in getting some one to take care of her old grass lawn. It cost only $65.

Houses Scarce in Buenos Aires

Startling living conditions as the result of high rents in Buenos Aires are disclosed in a report by Alejandro Bunge, director general of national statistics.

Eighty of each hundred families occupy only one room, he says. Of this 80 per cent., "nineteen families consist of four persons, twenty of five, eleven of six, four of eight, two of nine and one of seven persons, all living in one room in each case."

Comparing the respective positions of a workman in the United States and in Argentina, he cites the case of a bricklayer who in the United States with the wages earned in "600 working days could have built a house in 1919 which here would have taken the wages earned in 3,500 days."

However, he finds that the cost of necessities in the United States other than rent is about 60 per cent. higher than in this country.

Contraction of Cement Mortar

The Technical News Bulletin No. 39, issued July 13 by the Bureau of Standards, Department of Commerce, Washington, D. C., states that an attempt has been made to effect a combination of cement mortar by using a local mix that would not show unfavorable volumetric changes when cast in a dry absorptive form. Such a combination seems to have been obtained by using one part of this local mix with 6 parts of gravel screenings. The difference between this and other combinations is that the present one results in a harsh mix rather than a salvy or sticky one since 1:1 or 1:2 mortars, which are salvy or sticky, are inclined to show unfavorable volumetric changes. Results suggest that a harsh, initially inadhesive mix is more likely to be susceptible to influences for reducing volumetric change than any other type of mixture.

New Method of Producing Pictures

It is not often that an entirely new method of producing pictures is discovered, and an Oregon artist is attracting considerable attention with a process as pleasing as it is original. Instead of using fluid pigments of any kind, bits of colored cloth, painstakingly cut to particular shape and size of each detail of the work, are pasted upon the canvas background, which is stretched over thin board. Some of the almost infinitesimal particles of fabric are shredded out to mere threads to get the desired effect, while the bulkier objects of the scene are built up in relief, says *Popular Mechanics Magazine*. A sharp-pointed stick serves as a brush for this curious art. The finished pictures exemplify the remarkable results attained when patience and the artistic sense are coordinated.

Park Preservation Assured

By a decision of the Appellate Court of New York, a long-fought battle to retain Central Park purely for purposes of recreation and pleasure has been won. The opposition in the fight was not attempting to turn the park over for apartment house sites or anything of that kind, but was fostering a movement to place in the park various buildings for housing educational exhibits and the like. The court held that "a park is a pleasure ground, set apart for the recreation of the public and to promote its health and enjoyment," and that filling it up with buildings intended for more serious purposes was a mistake.

Whether it be New York or some smaller community, no city has breathing spaces enough, outdoor play spots enough, or sufficient area where its people may learn and enjoy the beauties of nature. There are in every city places more suitable for the erection of public buildings than its parks.

The world is wiser in such matters than it used to be. The park as an asset, promoting public health and cheerfulness and even improving real estate values, is better understood. And this is a good thing.

It is to be hoped that New York's example will be followed generally, and that every city will guard the playgrounds of the living and the sleeping places of the dead as she guards her Central Park and the sacred ground of old Trinity Church yard.

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The Cylindrical House

The house can be no wider than its lot, but it may be wider than its foundation, and roomier by several feet than the dimensions of its side would betoken. In proof of this a Kansas City man has built a 22-foot house on a 25-foot lot, and has seven feet of yard left—three and a half feet on each side. He accomplished this remarkable feat by making his house cylindrical. Far from sacrificing any element of beauty to the unusual design, the appearance of this novel dwelling is entirely pleasing, outside and in, says the *Western Contractor*. The foundation measures 18 feet wide by 36 feet long, with its walls vertical up to the swell of the cylinder. The basement windows are round port holes giving a nautical effect, and perched in the centre of the room, like a turret, is a little sleeping porch. The roof itself is a segment of a cylinder, extending over the front porch. Inside are four good-sized rooms and a large hall, which serves as a spare room by virtue of a built-in-bed, occupying the curve of the wall.

A Haunted House Demolished

Sherard House, in the High Street of Eltham, Kent, is being demolished to make room for business buildings, according to the *Architects' Journal* of London. It is of the seventeenth century, and one will be sorry to lose it; but the tramways are being extended through Eltham, which, from being a pleasant and quiet village, will soon become a noisy town. In anticipation and furtherance of this unhappy transformation, the beautiful old houses are disappearing, among them Sherard House, which was reputedly haunted by the ghost of a beautiful woman, whose murdered body, so the story goes, was taken through an underground passage and thrown into Eltham moat. There were sturdy old oak beams in the house, and it is stated that the oak panelling, staircasing, and other interior treasures have been bought by an enterprising American. It is not recorded whether he has bought the ghost as well. "Alas, poor ghost!"

National Theatre in Manila

Fifty prominent business men co-operating with the Philippine Government, propose to erect the "most beautiful and best equipped theatre in the far east, at an initial cost of one million dollars.

The National Theatre is to be of reinforced concrete, five stories in height. A roof garden will top the structure. A large grill and buffet will be operated on the ground floor; the chairs in the theatre will be specially constructed for the tropics, broad-seated and wide-armed, so that each person may sit comfortably and without crowding. Cold, filtered air will be piped through the entire building. The stage will be especially large for the accommodation of opera companies, Filipinos being enthusiastic patrons of grand opera.

Shower baths and lounging rooms will supplement the comforts of well-appointed dressing rooms and every modern stage equipment and apparatus for lighting effects will be installed. Private dining rooms on the second floor will copy the interiors of famous places in other cities; for example, the "London" room will be a miniature replica of the Ritz-Carlton grill, the "Tokyo" room will breathe the atmosphere of Japan, the "Peking," "Paris," "Rome" and "Washington" rooms will carry out similar schemes.

Municipal House-Building Considered

Governor Smith, of New York, before the joint legislative housing commission here, has declared himself an unqualified advocate of a proposal to empower New York City and other municipalities to meet their housing problems through municipal construction of dwellings.

Both Governor Smith and F. H. La Guardia, President of the Board of Aldermen, declared in favor of passing municipal legislation at the special legislative session called for September 20.

The chief opponent of the plan was Edward P. Doyle, secretary of Mayor Hylan's housing committee. He said it would cost the city $600,000,000 to go into the housing business, quoting figures to show that the cost of building materials and labor had increased 250 per cent. since 1914.

"The cost is not the question," answered Governor Smith. "Are you opposed to cities of the State acting in such an emergency as we have at this time?"

Mr. Doyle admitted he did oppose such action.

Mr. La Guardia outlined a plan which he submitted for the consideration of the commission.

"I would take the cost of construction," he said, "the same as we do with our piers, and I would fix the rental on the basis of a 7½ per cent. on the cost of construction. In thirty years it would amortize itself, even considering the cost of material and labor, we still could rent at far less than the artificially-created rentals of today."

Older Church Found Under Rheims Foundation

A treasure trove, dating from the beginning of the fifth century, has been found beneath the foun-

dations of the Rheims Cathedral, according to a special cable to the New York *Times*.

A few days ago workmen engaged on the restoration of the cathedral found traces of a far earlier building beneath it which the monkish records declare was a bascilica founded in honor of the Virgin by Sant Nicaise in the year 401. The nave of the primitive building was disclosed supported by three Roman arches in good condition.

An archeologist summoned made a careful investigation of the sandy floor of the ancient edifice and found buried in a corner sacred images of ivory strangely and beautifully carved among the mouldering debris. Evidently the priests of the period had buried their most precious treasures to save them from the barbarian invader 1,500 years before the German cannon thundered against the masterpiece of Gothic architecture that had replaced their primitive church.

New York Sky Scraper to Be the Largest

The $40,000,000 Park-Madison Building, which will occupy three city blocks, over the railroad tracks north of Grand Central terminal, between Park and Madison avenues, from 45th to 47th streets, will be the largest office structure in New York City and in the world.

This announcement was made recently by the Weaver-Crawford Corporation, 420 Park avenue, following receipt of a report from Warren & Wetmore, the architects, that the building will contain more than 1,600,000 square feet of floor space.

For a few years after its completion, the Woolworth Building, with its 50 stories, was the largest office building in the world. Then the Equitable Building rose a few blocks farther down Broadway to claim this distinction.

Now the prestige acquired by the greatest of skyscrapers is to move to the new financial and business district, around Grand Central terminal.

Plans for the Park-Madison Building have been amended so that a subway under 46th street will connect the two sections on Madison avenue, to be surmounted by twin towers 31 stories high. The section 17 stories high, fronting on Park avenue will be united with the main structure by a connecting wing over Vanderbilt avenue extension. Including the lease of the site from the New York Central railroad, the Park-Madison Building involves an expenditure of $40,000,000. It will be erected on a plan of co-operative ownership.

Esperanto Gains Recognition

Some months ago the Soviet Government of Russia submitted the whole question of international auxiliary language to an official commission. According to the *Nation's Business* after a thorough examination of various proposals the commission approved Esperanto as the best and it has been decided to use it in all the schools of the Russian Republic. Obligatory courses of study have already begun in Moscow, Petrograd, Tver, Orel and Smolensk.

For some time past the Republic of Brazil has favored Esperanto in its telegraphic and cable service by placing it on the same basis of charges as Portuguese, and is also introducing it in its courses of study in secondary schools.

For the first time in history the soldiers of Europe are forming international associations for education against war. A congress was recently held in Geneva and it was decided that, after October 1 of this year, Esperanto shall be the official and obligatory language of the correspondence and meetings of the federation.

The Chamber of Commerce of the State of New York, at its recent commercial examinations, gave the same value to Esperanto as to other languages, and a number of candidates passed the examination with success.

Personals

Samuel Prescott Hall and Col. H. M. Bush have entered into partnership under the name of Hall & Bush, with offices at 16 South Third Street, Columbuh, Ohio.

C. Howard Crane, Elmer George Kiehler and Cyril E. Schley announce the opening of a Chicago office at 127 North Dearborn Street, to be in charge of H. Kenneth Franzheim.

Borden B. Harris, consulting engineer, has opened an office at 132 Nassau Street, New York.

Peacock & Frank announce the opening of offices at 520 Colby-Abbot Bldg., Milwaukee, Wis., for architectural practice.

Harland Bartholomew announces the opening of new offices in the Compton Bldg., St. Louis, Mo., for professional practice in city planning and allied subjects.

Philip S. Avery has moved his office from 95 Milk St. to 99 Chauncy St., Boston.

Weekly Review of the Construction Field

With Reports of Special Correspondents in Prominent Regional Centers

WHILE undoubtedly the building industry will have to pass through a further period of readjustment as to price conditions, it is also equally true that the country is steadily moving forward to a normal basis of operation. The real attainment of such a desirable condition may be so long delayed as to cause the impatient ones to chafe, but it is only logical to assume that after so long a period of unsettled conditions, they cannot be brought to a satisfactory outcome except by the most careful and serious plodding to reach a final normality. In many sections and branches of the building industry this process of improvement is making distinct progress especially where better employment conditions exist. At the present writing the coal situation is probably the least encouraging spot in the general industrial field. The miners in the anthracite district are still on "vacation" in what it is expected will be a vain attempt to force the reopening of the wage award rendered by the coal commission and to which they had promised to abide.

"There is no general expectation that by postponing new building for a few months, marked savings may be realized through future declines in prices," reports the Guaranty Trust Co. "Even should the long-desired definite recession in prices develop it is believed that for some time yet building costs will show at best but slight decline and many think there will be further advances in building costs generally.

"The raw materials for building are available in abundance, sufficient to support the most ambitious building program and in the lumber industry it is estimated that there is an excess plant capacity of 50 per cent. The supply of materials may therefore in many cases promptly be enlarged whenever demand calls for it. Other lines of business enterprises are affected by credit stringency, but most of them show no such marked decline in activity os does the building industry. It appears that the transportation tangle is the primary source of the decline in building operations."

Statistics as to building operations during the month of August indicate that there was a slight increase in the total over July. In the northeastern quarter of the country, comprising twenty-five states, August operations amounted to approximately $206,000,000, as against $204,000,000 for July. There is nothing in this increase to indicate an upward trend in building activity, but other elements as referring to these figures would seem to indicate that the slump had reached its nadir.

The latest reports received on wage and labor conditions indicate that the situation is improving rapidly. There is a notable improvement in the supply of laborers, carpenters, masons and other building trade mechanics, with the possible exception of New York City.

There is little if any change in the general transportation conditions as affecting the supply of building material. The railroad management of transportation is concededly becoming more efficient and this efficiency will undoubtedly make itself felt in the building material market as fast as the necessities of transportation of the enormous grain crops have been taken care of. Naturally the general scale of prices of building materials has felt the effect of the increased freight rates, which in some commodities have created prices that to the ultimate consumers have seemed too high and have caused them to proceed cautiously in building operations.

A summary of building operations for the first six months of 1920 shows a total of approximately 31,000 building contracts let during that period, with a total value of about $1,500,000,000. Slightly more then one-half of this construction represents residential work at a total cost of $350,000,000, or less than one-quarter of the total valuation. The average for each residential project ranges from about $14,000 in the Northwest to more than $30,000 in the Middle Atlantic states, or a mean average for the entire country of about $22,000. This would indicate that most of the residential undertakings are multi-family buildings rather than individual houses.

Normal requirements for residential construction are calculated on two broad bases—to provide for increases in population and to replace wastage resulting from various causes. Despite the almost total cessation of residential construction during the war period and the slow return to normal conditions, the demands of the increased population have not lessened; nor have the forces of wastage, such as fire, deterioration and conversion to business purposes, diminished. The remodeling of residential buildings for commercial use or their total demolition to make way for purely commercial structures, has been notably increased, particularly in the larger cities. The natural result of this situation is a condition of congestion that is felt acutely throughout the country and particularly in the large centers of population.

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Among the principal causes of the disproportionately low amount of residential construction is the financial problem faced by the average home builder. The difficulty in securing a loan and the high rates demanded, together with the high cost of labor and materials, render it almost impossible for the average home builder to proceed with building operations. The man who erects his own home must consider its cost and maintenance as an expenditure. On the other hand, the excessive cost of construction of a commercial building is usually reflected in the increased rentals demanded and an increase in business profits.

The New England correspondent of THE AMERICAN ARCHITECT writes that although there seems to be a growing note of confidence in business circles in the New England states, there is evidence of timidity among dealers in taking options at the prices now ruling in a ragged building material market. Price cuts in materials have so far proved insufficient to start active buying. No one wants to be caught in a falling market with high cost materials on hand. Brick, North Carolina roofers, wood lath and oak flooring are examples of price reductions, but dealers report that no greater volume of business was noted after these price changes went into effect.

The prospective buyer believes that if prices have dropped at all they will continue to go lower. Manufacturers, on th eother hand, report that the weakness in quotations is based upon factors removed from the immediate conditions affecting building construction. Many of the latter believe that the entire building material supply situation is unsettled because of the impending great building movement, signs of which are actually appearing. They say that price reductions merely indicate the effort to secure an inside position for this promised new business—a scramble for early orders.

Dealers claim that fear of the rule of radical factions in the labor market is a damper on new building construction.

Events are occurring that suggest the building world is to see better things in the not distant future. The action of the American Woolen Co. this week in making a bid for a tremendous business this fall and winter is an example. The company named its new spring prices, and even with wages maintained at the highest rate in the history of the industry, it named prices on the average of 20 to 25 per cent. less than those prevailing in the fall of 1920. The response from buyers makes the officials of the company believe that orders will be obtained to keep the mills in full operation throughout the winter.

In explanation of the action of the company in thus slashing prices, President Wood said, "we are going after orders to fill our mills. It is time business started up. The way to start the market is to slash prices. No one can ask for lower prices than we have named. These are attractive and so far as we can forsee, no lower ones can be made. We have got to have prices such that our distributors can do business with confidence."

Whether this will be the beginning of a general naming of a new price basis throughout the industrial world which would command public confidence is a question. Many believe that such an attitude on the part of industrial leaders in general in going after new business will bring a full-fledged business boom after election.

The following facts and figures were taken from the files at the Boston Real Estate Exchange relative to transfers of all kinds.

Number of transfers for the week ending Sept. 4 was 441 and the number of mortgages was 208, with values amounting to $902,221. For the corresponding week in 1919 the transfers amounted to 351, mortgages 177 and amounting to $1,180,450. For the corresponding week in 1918 the transfers numbered 243 and mortgages 96, amounting to $436,812.

(By Special Correspondence to The American Architect.)

SEATTLE.—Due to the prostrated condition of the fir lumber market following the enactment of the emergency freight rates which have shut out fir from the short-haul eastern territory in favor of southern pine, more cars are being received by the mills than they can load, the shortage is at an end and cars spotted on mill tracks for loading have repeatedly been turned back to the carriers empty. Manufacturers who have been absorbing the freight differential in order to keep their organizations intact for better days announce with emphasis that they will not maintain the practice much longer, and that they will close down before they will quote less.

No. 2 vertical grain flooring is selling at the mills at $67.50 to $69, No. 2 and better slash grain, sizes 1x4, at $52.50; boards and shiplap are $27.50 to $30.50. Shingles are weak and a bottom is believed to be here in clears.

The shortage of reeds in 6 and 8 common, finishing and shingle is so acute all along the coast that jobbers of California, Nevada and Montana are wiring in to Seattle distributors for a supply. Similar conditions prevail as to small sizes of galvanized pipe, with halves, eights and three-quarters heading the list of shortages. Seattle jobbers during the week hold wires from these three states pleading for any sort of delivery, with small lots acceptable and no questions pressed as to the cost. Mixed carloads arriving with 10,000 to 15,000 feet are melted

away into the trade on arrival before unloading. It is the feeling among coast jobbers that the pipe situation will not improve this year. Plumbing supply houses tell jobbers that they will accept any small lots that may be grabbed out of the turmoil and will pay any price asked.

Eastern mills are refusing even to sketch the future as regards delivery of earthenware and enamelware. There are no price advances, as it seems to be the feeling that this would not cure the troubletrouble. There are no warehouse stocks on the coast. While there are no big jobs behind the demand, the retail trade will buy wherever stock is offered and pay the price without complaint. Delivery by rail from the East is irregular and disheartening.

Delivery of cement is very slow, although there is a group of heavy producing mills within 125 miles of Seattle. The demand has been ahead of delivery for six months. A little cement from British Columbia has been arriving by barge as an accommodation, as these plants are not offering on the open market.

There are no plaster stocks in Seattle, and none of the Pacific coast consuming markets are able to report any more satisfactory conditions. Mill conditions are believed by coast jobbers to be responsible. Salt Lake plants are doing best work in maintaining the coast supply.

Fire clay is arriving spasmodically, with California as the largest shipper into North Coast markets. The bulk of the brick is moving coastwise by water.

Jobbers of steel products, as nails and pipe, are endeavoring to meet a critical situation by invoking the aid of the ration plan. New accounts are offering freely, but despite the financial strength of these buyers all are being declined as diplomatically as possible under stress of emergency.

(By Special Correspondence to The American Architect.)

CHICAGO.—The problem of the building industry in Chicago has become one of financing rather than increased cost of material. The question of obtaining labor is no longer a thing for contractors to worry about. In fact, labor is hunting up the contractor, instead of the contractor bidding for labor. This condition is pretty general throughout the Middle West and has been for some time.

Some weeks ago, from some rather mysterious source, there came over the financial field a firm belief that it was not good business for the bankers to make further loans on real estate and building projects. Whether this belief was based on the feeling that such loans could no longer be considered as safe investments was not explained. Nevertheless, the belief apparently was unanimous among the bankers. And as the purse strings tightened building gradually declined until today, in Chicago and vicinity, construction work has been confined to the more pretentious hotels, apartment houses and larger commercial structures.

While the general public has suffered for the need of ample housing, the situation has not been an unmixed evil. It has tended to squeeze out some of the autocratic poison that has been afflicting labor. Mechanics are beginning, finally, to realize that the slogan, "fewer hours and more pay," eventually, when applied generally, will drive them to the line of subsistence just as surely as will long hours and less pay, for decreased production means economic ruin for all.

The settlement of the "outlaw" switchmen's strike is looked upon as one of the hopeful events of the past week. This ends the last of the more serious labor troubles that have been springing up from time to time during the summer. The defeat of this group of hectic labor enthusiasts has demonstrated that transportation can be maintained even without switchmen, and has emphasized to labor that industry requires both capital and labor if all are to prosper. On the other hand, railroad managers have been taught the much needed lesson of waste elimination in transportation service through an increase in freight car loading and mileage.

Lumber prices in this section, due largely to the decrease in demand, have dropped from twelve to twenty per cent. Prices of cement, stone and other of the heavier building materials, however, have advanced, due to their increased use in both buildings and highways. Expressions are heard that steel may become a little more plentiful because of the slacking up in the automobile industry, which has been "overplayed" recently.

An interesting meeting of the Real Estate Association of the state of Illinois will be held at Rockford, Ill., beginning Sept. 30, at which prominent bankers of the Middle West will discuss real estate and building financing. Some valuable suggestions are expected to come at this meeting.